

PERCEPTUAL LEARNING STYLE PREFERENCES  
AND THEIR RELATIONSHIP TO LANGUAGE LEARNING STRATEGIES  
IN ADULT STUDENTS OF ENGLISH AS A SECOND LANGUAGE

---

A Dissertation  
Presented to  
The Graduate School of Education  
Drake University

---

In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Education

---

by  
Laura Rossi-Le  
August 1989


PERCEPTUAL LEARNING STYLE PREFERENCES AND THEIR  
RELATIONSHIP TO LANGUAGE LEARNING STRATEGIES IN ADULT  
STUDENTS OF ENGLISH AS A SECOND LANGUAGE

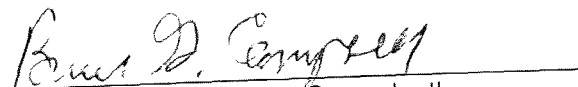
by


Laura Rossi-Le

Approved by Committee:

  
Edward E. Hakanson, Chair

  
Charles S. Greenwood

  
Bruce G. Campbell

  
James L. Romig, Dean of the School of Education

1989  
.R435  
C.2

PERCEPTUAL LEARNING STYLE PREFERENCES  
AND THEIR RELATIONSHIP TO LANGUAGE LEARNING STRATEGIES IN  
ADULT STUDENTS OF ENGLISH AS A SECOND LANGUAGE

An Abstract of a Dissertation by  
Laura Rossi-Le  
August 1989  
Drake University  
Advisor: Dr. Edward E. Hakanson

**The problem.** In exploring the differences that exist among second language learners, researchers have focused on different aspects of cognitive learning style--an individual's preferred means of processing information. Within the cognitive domain, perceptual learning style emerges as a neglected, yet significant factor in second language acquisition. Through the learner's perceptual channels, classified as auditory, visual, tactile and kinesthetic, information is taken in, encoded and stored. It was the purpose of this study to investigate the interplay between an individual's dominant perceptual style and the strategies he/she employs in learning a second language.

**Methods.** Using a sample of 147 adult immigrants, two areas were researched. The first involved the relationship between an individual's learning style preference and factors in his/her background including age, sex, native language, level of English proficiency, educational background, period of residence in the United States and work history. The second area of investigation focused on the interrelationships among learning style preference, background variables and learning strategies.

The subjects were enrolled in community college English as a Second Language (ESL) classes. The linguistic backgrounds represented were (1) Chinese, (2) Laotian, (3) Vietnamese, (4) Spanish and (5) Other (a sampling of different languages).

The study was based on an analysis of data derived from a several sources. Two self-assessment instruments designed specifically for ESL students were used--the Perceptual Learning Style Preference Questionnaire and the Strategy Inventory of Language Learning (SILL). English proficiency levels were established using scores from the Michigan Test of English Language Proficiency. In addition, a questionnaire was administered to gather background data on the subjects. To investigate the relationship among the variables stepwise multiple regression, chi-square and multivariate analyses were performed.

**Findings.** The findings consist of relationships among the variables in each of the two areas of investigation. First, it was shown that perceptual learning style preference is influenced by factors in the learner's background, particularly native language. Overall, the dominant learning

style preferences for the sample were tactile and kinesthetic. Second, relationships were found between learning styles and strategic approaches to second language learning. The strongest correlation existed between visual learning style and visualization strategies. In general, the study has shown that a complex system of interactions exists among background characteristics, learning style preferences and language learning strategies.

## Table of Contents

	Page
List of Tables.....	i
Chapter	
1. Introduction .....	1
Purpose of the Study.....	5
Hypotheses.....	6
Terminology.....	8
Assumptions .....	9
Threats to Validity .....	9
Summary .....	10
2. Literature Review.....	12
Learning Style Theory .....	13
Learning Strategies.....	23
Summary.....	25
3. Methods and Procedures.....	27
Sample .....	27
Instrumentation.....	28
Data Collection Procedures.....	32
Data Analysis.....	33
Summary.....	37
4. The Results .....	38
Descriptive Statistics.....	38
Hypotheses Testing.....	40
Residual Analysis .....	69
Multivariate Analysis of Variance.....	70
Summary.....	75

5. Summaries, Conclusions, Implications .....	78
Discussion of the Findings.....	79
Implications.....	87
References .....	90

## Appendices

- A. Strategy Inventory of Language Learning
- B. Perceptual Learning Style Preference Questionnaire
- C. Michigan Test of English Language Proficiency
- D. Questionnaire of Student Background Characteristics
- E. Subject Consent Form
- F. Normal Probability Plots for MANOVA

## List of Tables

Table	Page
1. Learning Style Preference Means and Native Language .....	40
2. Learning Strategy Means and Native Language .....	41
3. Multiple Regression Analysis of Auditory Learning Style and Background Variables .....	42
4. Multiple Regression Analysis of Visual Learning Style and Background Variables .....	42
5. Multiple Regression Analysis of Tactile Learning Style and Background Variables .....	43
6. Crosstabulation of Tactile Learning Style and Sex.....	44
7. Multiple Regression Analysis of Kinesthetic Learning Style and Background Variables .....	45
8. Crosstabulation of Kinesthetic Learning Style and Work History.....	46
9. Multiple Regression Analysis of Group Learning Style and Background Variables .....	47
10. Multiple Regression Analysis of Strategy Group A, Perceptual Learning Styles and Background Variables.....	48
11. Crosstabulation of Strategy Group A and Kinesthetic Learning Style .....	49
12. Multiple Regression Analysis of Learning Strategy Group B and Background Variables .....	50
13. Crosstabulation of Strategy Group B and Tactile Learning Styles.....	51
14. Crosstabulation of Strategy Group B and Kinesthetic Learning Style.....	52
15. Multiple Regression Analysis of Learning Strategy Group C, Perceptual Learning Styles and Background Variables.....	53
16. Crosstabulation of Learning Strategy Group C and Visual Learning Style Preference.....	54

17. Multiple Regression Analysis of Learning Strategy Group D, Perceptual Learning Styles and Background Variables.....	55
18. Crosstabulation of Strategy Group D and Auditory Learning Style.....	56
19. Crosstabulation of Learning Strategy Group D and Kinesthetic Learning Style Preference.....	57
20. Multiple Regression Analysis of Learning Strategy Group E, Perceptual Learning Styles and Background Variables.....	58
21. Crosstabulation of Learning Strategy Group E and Auditory Learning Style Preference.....	59
22. Crosstabulation of Learning Strategy Group E and Visual Learning Style Preference.....	59
23. Multiple Regression Analysis of Learning Strategy Group F, Perceptual Learning Styles and Background Variables.....	61
24. Multiple Regression Analysis of Learning Strategy Group G, Perceptual Learning Styles and Background Variables.....	61
25. Multiple Regression Analysis of Learning Strategy Group H, Perceptual Learning Styles and Background Variables.....	62
26. Crosstabulation of Strategy Group H and College Background.....	63
27. Multiple Regression Analysis of Learning Strategy Group I, Perceptual Learning Styles and Background Variables.....	64
28. Crosstabulation of Learning Strategy Group I and Visual Learning Style.....	65
29. Crosstabulation of Strategy Group I and Job Training .....	66
30. Crosstabulation of Strategy Group I and College Background.....	66
31. Multiple Regression Analysis of Learning Strategy Group J, Perceptual Learning Styles and Background Variables.....	68
32. Crosstabulation of Learning Strategy Group J and Individual Learning Style .....	68
33. Relationship of Age and Language Proficiency to Perceptual Learning Styles.....	71



34. Relationship of Language Background to Perceptual Learning Styles.....	72
35. Relationship of Sex to Perceptual Learning Styles.....	72
36. Relationship of Perceptual Learning Styles and Language Learning Strategies.....	74
37. Summary of Significant Relationships between Perceptual Learning Styles and Background Variables (Hypotheses 1-6) .....	76
38. Summary of Significant Relationships between Learning Strategy Groups, Learning Styles and Background Variables .....	77

## CHAPTER 1

### Introduction

Research efforts in second language instruction have over the past ten years shifted from an emphasis on the role of the teacher to that of the learner. Studies dealing with individual differences in the learning process have focused on such questions as what makes a good language learner and why some students develop proficiency more quickly and easily than others (Bialystok, 1979; Chapelle & Roberts, 1986; Naiman, Frohlich, & Todesco, 1975; Rubin, 1975). In their more student-centered approach, researchers have explored the relationship of learning style to second language acquisition. As defined by Keefe (1987), "learning styles are characteristic cognitive, affective and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with and respond to the learning environment" (p.5). Shaped by heredity, age, past and present environmental factors and cultural background, learning style is an individual's preferred method of receiving and processing information (Gregorc, 1979; Kolb, 1984). Applied to the second language learner, learning style theories provide a dynamic basis for assessing the way an individual perceives and interacts with both the target language and the instructional context as he/she works to develop proficiency.

Varied aspects of the cognitive dimensions of learning style which encompass the learner's preferred mode of perceiving, thinking and remembering, have been explored in relation to the second language learning process (Genessee & Hamayan, 1980; Hansen & Stansfield, 1981;

Ramirez, 1986; Reinert, 1976). However, within the domain of cognition, second language researchers have neglected the area of perceptual modalities--the preferred channels (auditory, visual, tactile and kinesthetic) through which an individual receives and retains information. Research in perceptual learning has focused on native speakers of English, primarily children (Carbo, 1984; Dunn & Dunn, 1978; Barbe & Milone, 1980, 1981) and to a lesser extent on adults (Cherry, 1981; Dorsey & Pierson, 1984; Galbraith & James, 1984; Kolb, 1984). The first comprehensive study of adult students of English as a Second Language (ESL) was undertaken by Reid (1987) who has provided baseline data on the perceptual learning styles of 1,234 foreign students attending American colleges.

The fact that the perceptual learning style preferences of adult, non-native speakers of English had not been investigated prior to Reid's study (1987) is surprising given the important place held by perceptual modalities in learning style theory and the implications modality learning has for ESL instruction. Barbe, Swassing, and Milone (1979) view the sensory modes as "the keys to learning" (p. 1) and point to the vital role perception plays in thought processes. In terms of language learning, perceptions play a central part. A critical link exists between the learner's senses, particularly the auditory and visual channels, and the verbal and nonverbal aspects of language that the learner is attempting to process and incorporate. Furthermore, studies on other aspects of cognition, such as field dependence and independence, have focused on diverse ethnic groups and have demonstrated that cultural, social and educational factors have a significant effect on learning style development (Gonzales & Roll, 1985;

Lesser, Fifer & Clark, 1965; Ramirez & Castaneda, 1974). Similar factors seem to influence perceptual learning style development as evidenced in the significant differences in modality preferences exhibited by the foreign and American college students surveyed by Reid (1987). More in-depth research is needed to assess the role that perceptual learning style preference plays in ESL instruction and learning.

The results of Reid's study (1987) open two important areas for future exploration--cultural influences and learning strategies. The first issue in need of investigation concerns the impact of culture on learning behavior. Brookfield (1986) cautions, "How can we write confidently of adult learning style in any generic sense when we know little . . . of the cognitive operations of, for example, Asian peasants . . . " (p. 33). Part of an individual's cultural framework is his/her language, social standing, and educational background--all of which affect cognitive development (Lesser et al., 1965). Reid's study (1987), which indicates a relationship between ethnic background and perceptual learning style, points to the need for continued investigations into the effect cultural factors have in shaping patterns of adult language learning behavior. An extension of Reid's data is needed to include information on immigrant groups not yet surveyed, particularly Southeast Asians and Hispanics who often dominate ESL programs at community colleges and adult education centers. In addition, Reid's study hints at the changes in learning style that might occur through continued exposure to the host culture. Since perceptual learning styles have been shown to change over time as individuals mature and develop (James &

Galbraith, 1985; Messick et al., 1976), it is possible that the process of acculturation can also alter learning style preference.

The second issue that surfaces concerns the accuracy of the subjects' self-perceptions and the extent to which cognitive style preferences actually determine the learning strategies employed by second language students. Research has shown that students are able to identify their perceptual style preferences (Dunn, 1984; Farr, 1971) and are also able to specify the strategies, or techniques, that they have used in completing the learning tasks (Bialystok, 1981; O'Malley, Chamot, Stewner-Manzanares, Russo, & Kupper, 1985; Oxford, 1986a; Wenden, 1986). Learning strategy research is extensive and has resulted in the development of a variety of systems for categorizing self-selected methods of learning in both academic and social settings (O'Malley et al., 1985b; Oxford, 1986b; Rubin, 1975). Ties have been shown to exist between the strategies that the language learner employs either consciously or unconsciously and his or her personality, age, level of proficiency, and motivation for studying the language (Politzer & McGroarty, 1985). However, the extent to which cognitive styles determine learning strategies has not been studied to any great degree (Abraham, 1983; O'Malley et al., 1985). In order to assess the strategies used by the subjects in this study, the Strategy Inventory of Language Learning (SILL) developed and validated by Oxford (1987) was used (see Appendix A for instrument). The relationship between strategy use and perceptual learning style has implications for creating instructional designs that are student-centered and that foster self-directed learning.

### **Purpose of the Study**

Based on the issues that have surfaced as a result of Reid's (1987) research findings, it was the purpose of this study to explore the nature of perceptual learning style preference in terms of its application to the language learning process of the adult ESL learner. The modality preferences of immigrant groups that ranged from low intermediate to advanced levels of English proficiency were surveyed with the intention of expanding the baseline data produced by Reid's investigations. In an effort to understand the interplay between subconscious learning style preferences and observable language learning behaviors, the strategic approaches that students take in learning a language were analyzed. A potential outcome of the study is the contribution of information that will prove useful in the process of developing teaching methodologies, curricula and materials reflective of the learning style preferences of adult immigrants.

In attempting to fulfill the above objectives, this study will focus on the following research questions:

- (1) What is the relationship of the perceptual learning style preferences of adult immigrants studying English as a Second Language to the variables of age, sex, native language, educational background, level of English proficiency, period of residence in the United States and work history in the United States.
- (2) To what extent do the background characteristics and perceptual learning style preferences of adult immigrants studying ESL influence their selection of language learning strategies.

## Hypotheses

The 16 hypotheses tested can be divided into two groups, those that relate to learning styles (1-6) and those that deal with learning strategies (7-16). The hypotheses are as follows:

- (1) A significant relationship exists between the auditory learning style preference of adult immigrant ESL students and the background variables of age, sex, native language, level of English proficiency, educational background, period of residence in the United States and work history in the United States.
- (2) A significant relationship exists between the visual learning style preference of adult, immigrant ESL students and the background variables.
- (3) A significant relationship exists between the tactile learning style preference of adult, immigrant ESL students and the background variables.
- (4) A significant relationship exists between the kinesthetic learning style preference of adult, immigrant ESL students and the background variables.
- (5) A significant relationship exists between the individual learning style preference of adult, immigrant ESL students and the background variables.
- (6) A significant relationship exists between the group learning style preference of adult, immigrant ESL students and the background variables.

- (7) For the population of adult, immigrant ESL students, a significant relationship exists between learning strategy group A (general strategies) and either (a) perceptual learning style preferences or (b) the background variables.
- (8) For the population of adult, immigrant ESL students, a significant relationship exists between learning strategy group B (authentic language use) and either (a) perceptual learning style preferences or (b) the background variables.
- (9) For the population of adult, immigrant ESL students, a significant relationship exists between learning strategy group C (communicating meaning) and either (a) perceptual learning style preferences or (b) the background variables.
- (10) For the population of adult, immigrant ESL students, a significant relationship exists between learning strategy group D (independent strategies) and either (a) perceptual learning style preferences or (b) the background variables.
- (11) For the population of adult, immigrant ESL students, a significant relationship exists between learning strategy group E (memory strategies) and either (a) perceptual learning style preferences or (b) the background variables.
- (12) For the population of adult, immigrant ESL students, a significant relationship exists between learning strategy group F (social strategies) and either (a) perceptual learning style preferences or (b) the background variables.



- (13) For the population of adult, immigrant ESL students, a significant relationship exists between learning strategy group G (affective strategies) and either (a) perceptual learning style preferences or (b) the background variables.
- (14) For the population of adult, immigrant ESL students, a significant relationship exists between learning strategy group H (self-management) and either (a) perceptual learning style preferences and (b) the background variables.
- (15) For the population of adult, immigrant ESL students, a significant relationship exists between learning strategy group I (visualization strategies) and either (a) perceptual learning style preferences or (b) the background variables.
- (16) For the population of adult, immigrant ESL students, a significant relationship exists between learning strategy group J (formal model building) and either (a) perceptual learning style preferences or (b) the background variables.

### **Terminology**

The terminology in the hypotheses requires clarification. Perceptual learning style preference refers to the perceptual channels through which students prefer to learn. These can be classified as (1) auditory (listening to lectures and tapes), visual (reading and studying charts), kinesthetic (experiential, total physical involvement), tactile (hands-on, doing lab experiments) and interactive (group or individual learning) (Reid, 1987). They were measured using the Perceptual Learning Style Preference Questionnaire (see Appendix B for instrument). In contrast, learning

strategies are the techniques that students employ in order to facilitate their learning of the material, such as repeating words orally or taking notes. The learning strategy groupings (A-J) used in this study correspond to the categories on the Strategy Inventory of Language Learning (see Appendix A for instrument.)

Adult immigrants refer to subjects between the ages of 20 and 52 who belong to diverse ethnic groups that have come to the United States for the purpose of permanent resettlement. Level of English proficiency was measured using the Michigan Test of English Language Proficiency, a standardized test of grammar, vocabulary, and reading (see Appendix C for instrument).

Educational background relates to the amount of time the subjects spent in school and whether or not they attended college and/or job training programs. Period of residence in the United States refers to the length of time students have lived in the host country. Work history means the amount of time the subjects have been employed since they arrived in the United States.

### **Assumptions**

The study was based on an underlying assumption that the proficiency levels of the subjects would be determined through standardized testing by the researcher and not through class placements in the ESL programs of the community colleges.

### **Threats to Validity**

Two possible limitations exist and must be considered in terms of the study's internal validity. The first involves the issue of mortality. In order to

reduce the chances of students dropping out during the testing period, all tests were administered over a two-week period early in the semester.

The second limitation involves the nature of the instruments used in collecting the data. Both the Perceptual Learning Styles Preference Questionnaire and the Strategy Inventory of Language Learning elicit self-reported, retrospective data that are dependent upon accurate recall and an understanding of specific terminology and concepts (see Appendices A and B for instruments). Because the tests were administered during the time that students are actively participating in ESL classes, the accuracy of the retrospective information should be enhanced. In addition, attempts were made to avoid misinterpretations of the questions by providing training sessions in the respective native languages of the participants. Only editions of the self-assessments that have been written specifically for ESL students were used.

In terms of external validity, the study dealt solely with adult immigrants participating in ESL classes at two community colleges, one in the midwest and the second in the northeast. As a result, the findings cannot be generalized to the larger population of second language learners.

### **Summary**

To summarize, the study has attempted to define more clearly the perceptual learning style preferences of adult immigrants studying English and the relationship of these preferences to the process of second language learning and instruction. The second chapter of this study presents a review of the literature that exists on cognitive and perceptual learning styles as well as on the learning strategies employed by ESL students. The third

chapter describes the methodology to be used in conducting the study. It is hoped that the findings will be of practical use to teachers, curriculum developers and administrators in the field of ESL and will contribute to an understanding of the roles that learning styles and strategies play in second language learning.

## CHAPTER 2

### Literature Review

As immigrants in the United States, many adults from diverse cultural, linguistic and educational backgrounds find themselves in the position of having to learn a second language in order to survive economically, socially, and often academically in a new society. Some are successful in acquiring the target language while others are not. Their potential success or failure is determined in large part by the complex interaction of factors related to the second language learning process, the environment, and the nature of the individual learner. In acquiring a second language, the learner must internalize a completely new system of communication comprised of unfamiliar sound patterns, syntactic rules and vocabulary. The second language may appear to be "a confusing disarray of complex verbal stimuli that reach the learner solely as if they were 'noise'." How does the language learner cope with this complexity and uncertainty?" (Naiman et al., 1975, p. 65). The potential answers for many researchers may lie in an analysis of the second language learner's cognitive learning style--an individual's preferred means of receiving, processing, and assimilating information to bring about learning.

Within the domain of cognition, perceptual learning style emerges as a neglected, yet significant factor in second language learning. The way in which the second language learner perceives and organizes stimuli occurring in the learning environment determines his or her facility in acquiring the language. Through the learner's perceptual channels broadly

classified as visual, auditory, tactile and kinesthetic, information is taken in, encoded and stored (Gagne, 1977). The relationship that perception has to the overall process of second language acquisition has yet to be fully explored. Reid (1987) has taken a first step in providing a global view of the learning style preferences of diverse linguistic groups. However, as Reid explains, future investigations that replicate and expand upon her research are needed.

The intention of this study was to extend Reid's baseline data to include adult immigrants studying ESL and to determine how perceptual learning styles manifest themselves in the learning process. In keeping with the study's purpose the literature review focuses on three areas of research: (1) learning style theory particularly as it relates to perceptual preferences and second language acquisition; (2) characteristics of the adult immigrant that might influence learning style, such as age, language proficiency, cultural and educational backgrounds and length of time in the United States, and (3) the learning strategies that students employ to facilitate the second language learning process.

### **Learning Style Theory**

An overview of cognitive learning style theories yields a fragmented picture. According to Keefe (1987), the exploration of learning styles begun by educational psychologists in the 1960s has never resulted in a comprehensive research effort. Instead, a diversity of theoretical approaches and models has emerged over the past twenty years. Most of the research attention has focused on the concept of field dependence, a holistic approach to learning, versus field independence, an analytical

approach to information processing (Halverson, 1979; Ramirez & Castaneda, 1974; Witkin, 1977). Moving in another direction, Gregorc (1979), postulating that individuals learn in a combination of dualities, divided the learning process into quadrants—concrete-sequential, concrete-random, abstract-sequential and abstract random. In his work with adults, Kolb (1984) designed an experiential learning model that consists of four integrated stages—concrete experience, observation and reflection, formation of abstract concepts and generalizations and evaluation of concepts in new situations. Hill (1971) developed a system through which an individual could create a cognitive map of the way he/she processed information.

Emerging from the diversity of cognitive learning models is a shared perspective that learning styles represent distinctive and fairly consistent modes of responding to and processing information (Gregorc, 1979; Keefe, 1987; Witkin, 1977). In addition, learning styles have been shown to vary from one individual to another and to carry the markings of heredity, environment and past experience (Gregorc, 1979; Dorsey & Pierson, 1984; Kolb, 1984). As a mechanism that controls how information is processed, learning style can be distinguished from ability, an innate capacity related to both the type of information processed and the operation used (Keefe, 1987). In general, cognitive learning style is an individual's preferred mode for perceiving, organizing and retaining information.

Within the cognitive domain, "the process most intimately associated with learning" is perception (Barbe & Milone, 1981), the manner in which the senses receive and extract information from the environment (Cherry, 1981).

"Perception becomes the core process in the acquisition of cognitive knowledge" (Forgus, 1966, p. 2). Gagne (1977) considers the most important aspect of the learner to be his or her senses, central nervous system and muscles; before information can be learned, it must be taken in by the senses. The act of perception gives meaning to the environmental stimulus and resulting sensation; then, through linkages established with past experiences and familiar events, the new information can be stored in short or long-term memory (Barbe, Swassing & Milone, 1979; Gagne, 1977).

The learner receives and organizes information through his or her preferred sensory channels. Cherry (1981) identified seven such channels: print (written word), aural (listening), interactive (verbalization, small group discussion), visual (observation, pictures, graphs), haptic (touch, hands-on), kinesthetic (movement), and olfactory (smell). Heredity, maturation, age and culture are all factors that determine which of the modalities will be the most dominant and well-defined (Barbe & Milone, 1980). According to Messick et al. (1976), perceptions provide the basis for "understanding experience, through the mind's hand . . . or the mind's eye or the mind's ear . . ." p. 21. For the second language learner perceptions are the key to the verbal and visual cues of a new system of communication.

An overview of perceptual learning style research does not provide a coherent picture of perceptual learning style dominance in either children or adults. One possible reason for the varied results is the inconsistencies in measurement techniques (Cherry, 1981). Some researchers have focused on an assessment of perceptual strengths by using instruments that measure the dominant modalities actually used by the subject to complete a



series of designated tasks (Barbe et al., 1979; Cherry, 1981; Galbraith & James, 1984). Others have used self-reporting surveys and inventories to determine the learner's preferred styles (Dunn & Dunn, 1978; Farr, 1971; Keefe, 1987; Reid, 1987; Reinert, 1976).

A second possibility for the variations in the research findings can be attributed to a lack of agreement on the terminology used to define the perceptual channels being measured (Cherry, 1981). For example, the print medium might be included as part of visual learning or measured as a separate entity. Similarly, the term auditory learning sometimes indicates verbal interactions while at other times it refers to the aural channel alone. Confusion has also developed around the interchangeable use of the classifications haptic (the entire hand) and tactile (the fingertips). Finally, a probable source of research inconsistencies is the marked variance that exists in perceptual learning style from one individual to another and from one age group to another (Galbraith & James, 1984; Messick et al., 1976).

Some controversy exists as to whether or not learners can predict their own learning styles. Cherry (1981) showed a slightly negative correlation between self-assessed learning style preferences and learning style strengths tested using the Multi-Modal Paired Associates Learning Test II. However, these findings were tempered by the fact that each group had individual subjects that did not share the group strength and that learning style variations, in general, are seen in all populations. In addition, years of formal education as well as knowledge of learning style concepts contributed to positive correlations between perceptual learning style strength and preference in Cherry's study. Evidence is also presented on

the side of those who maintain that learning style preferences are predictable. Dunn (1984) showed that most students correctly identify their learning style strengths, especially if the style is strongly preferred or rejected. In addition, Farr (1971) tested college students in two modalities—auditory and visual—showing that "individuals were able to predict successfully the modality in which they would demonstrate superior learning performance." (p. 126) In light of the conflicting opinions on the accuracy of learning style self-assessments, the backgrounds of the students need to be considered in choosing an appropriate instrument.

Research with native speakers of English has produced diverse results in terms of perceptual learning style strengths and preferences. Barbe and Milone (1981) in a comprehensive study of the perceptual learning style strengths of 1,000 elementary and high school students have shown that overall 30 percent of the subjects relied on the visual modality, 25 percent on the auditory, 15 percent on the kinesthetic and the remaining 30 percent on a combination of modalities. Focusing on learning style preferences, Dunn and Dunn (1978) found that 20-30 percent of school age children are auditory learners, 40 percent are visual, and the remaining 30-40 percent are tactile/kinesthetic, visual/tactile, or some other combination. In contrast, Keefe (1987) noted that children are primarily tactile and kinesthetic learners evolving into visual and auditory learners as they grow older. Similarly, Price, Dunn, and Sanders (1981) found that very young children are the most tactile/kinesthetic and that there is a gradual shift toward the visual mode through the elementary grades and that only in the fifth grade can children learn auditorily.

Studies of adults have also produced conflicting findings. Galbraith and James (1984) used the Multi-Modal Paired Associates Learning Test II refined by Cherry (1981) to identify the perceptual modality strengths of 319 adults ranging in age from 20 to 50 and above. The elements studied were print (written form), aural, interactive (group discussion), visual (pictorial form), haptic, kinesthetic and olfactory. Rankings of the perceptual learning strengths of subjects from 20 to 49 years of age were (1) visual, (2) haptic, (3) interactive, (4) aural, (5) print, (6) kinesthetic, and (7) olfactory. In the group aged 50 and above the pattern was similar with interactive taking second place, aural third place and haptic fourth. In a study of 96 adults also tested with the MMPALT II, Cherry (1981) discovered the visual element to be the most dominant perceptual strength and the kinesthetic element to be the most dominant preference. Adults are able to use more than one perceptual modality in processing information; however, particularly in stressful situations, they rely on the most dominant one (Barbe et al., 1979; Messick et al., 1976).

Research efforts into the perceptual learning style preferences of second language learners are in their preliminary stages. Noting the general lack of comprehensive research on adult learning styles, Brookfield (1986) refers to the absence of studies on groups that are not part of the mainstream in the United States, such as Native Americans, Hispanics and Asians. Any research that does exist is fragmented and concentrates more on aspects of cognition not related to perceptual learning styles. However, even the scattered findings show that culture plays an important role in

determining how a learner processes information (Gonzales & Roll, 1985; Lee, 1976; Lesser et al., 1965; Ramirez & Castaneda, 1974).

As defined by Brown (1980), culture refers to the "ideas, customs, skills, arts, and tools which characterize a group of people in a given period of time." (p. 123) Cultural patterns provide a context for the development of cognitive and affective behaviors. Witkin (1977), demonstrating the importance of social structure in determining field dependence and independence, showed that pastoral, sedentary groups in need of social skills for close living arrangements are field dependent while migratory hunting groups in need of analytic skills in homogenous surroundings are field independent. Lesser et al. (1965) in a study of six and seven-year-old Chinese and Jewish children reported that ethnic group identity and not social class was associated with their verbal, abstract, numerical, and spatial abilities. Regardless of social class ties, the Chinese children had stronger spatial abilities while the Jewish children showed stronger verbal abilities. Ramirez & Castaneda (1974) tied the differences in cognitive styles to differences in socialization practices. Because of the emphasis on respect for family and authority figures, Mexican American children are more field sensitive while Anglo-American children brought up in families that stress autonomy and independence are more field independent.

A few studies touch on the perceptual aspects of cognitive learning style and their relation to cultural influences. Bennett (1979) showed that many Black and minority children come from an oral tradition, and therefore, learn better through an auditory presentation of material. Dorian (1985) tested Iranian and Alaskan students in their native countries and found the

majority to be visual learners. Lee (1976) noted that Asian societies emphasized visual learning largely as a result of the visual memory needed to learn language systems, such as Korean and Japanese, 10-50 percent of which include Chinese logograms. Tactile learning is also a key aspect of the learning process of Asians who trace forms with the index finger until the word becomes functional.

Culture as one of the determinants of perceptual learning style has been explored in Reid's (1987) study of foreign and American students attending universities in the United States. Using a self-report questionnaire based on existing learning style instruments and adapted to a limited English-speaking population, Reid surveyed 1234 intermediate and advanced level students participating in 39 university-affiliated intensive English programs in addition to 154 native speakers of English at Colorado State University. A total of 98 countries and 52 language backgrounds were represented.

In comparisons made among different ethnic groups including Americans, Reid (1987) demonstrated that perceptual learning style preference categorized as visual, auditory, kinesthetic, tactile, individual and group learning varied significantly. Her findings demonstrated that, overall, the non-native speakers in her survey, which included Arabic, Spanish, Japanese, Malay, Chinese, Korean, Thai, and Indonesian students, had a strong preference for kinesthetic and tactile learning; the majority showed a negative preference for group learning. Korean students emerged as the most visual while Japanese students were the least auditory in their perceptual preferences. Native speakers of English were considerably less

tactile in their preferences than non-native speakers and demonstrated a preference for auditory and kinesthetic learning, a finding which conflicted with the visual dominance of adults identified in other studies.

Additional key factors noted as contributing to the formation of learning style preference evidenced in Reid's (1987) research were (1) age, (2) education level, (3) level of English proficiency, and (4) amount of time spent in the United States. Many of the findings corroborate those presented in other studies.

In terms of age, the learning style preferences of older students were more clearly delineated with visual and auditory modalities being the strongest (Reid, 1987). Other studies have also identified visual dominance among adult learners (Cherry, 1981; Galbraith & James, 1984; Keefe, 1987; Price et al., 1981). The research of Barbe and Milone (1981) illustrates shifts that occur in learning style preferences as individuals mature and develop. In the primary years the perceptual learning style strengths are more well-defined with the dominant one being auditory. From the first through the sixth grades visual and kinesthetic preferences come to dominate; high school age students and adults show more visual and auditory dominance. According to the researchers, the shift represents a change in the environment as students learn to read (visual) and write (kinesthetic). Each individual's perceptual strengths become more varied giving the student flexibility in his or her approach to the instructional material.

The relationship of education to perceptual learning style dominance is sketchy in Reid's (1987) and earlier studies. Reid reports that graduate students had a greater preference for visual learning than undergraduates.

The educational background and academic experiences of the students in their native countries were not specified; the learning environment and educational level of the students in the United States were fairly homogeneous. Therefore, influences on perceptual preferences could not be inferred. Other studies have shown that previous educational experiences have an effect on the cognitive styles and classroom behaviors of students from other cultures (Politzer & McGroarty, 1985). In addition, studies of adult learners who are native speakers of English show that more highly educated adults self-select their learning preferences with greater accuracy (Cherry, 1981) and that their mean scores in all of the dominant learning modes are higher (Galbraith & James, 1984).

Acculturation, the process through which individuals adjust to and assimilate key aspects of the host culture, emerges as an important determinant in the learning style preferences that students exhibit. Reid (1987) touches on this issue indirectly in her considerations of the English proficiency levels of her subjects and the length of time they had spent in the United States. Those students who were more proficient showed learning style preferences more closely related to native speakers of English as did those students who had lived in the United States the longest, in this case three years or more. Reid suggests that learning style preferences can be modified. On a more general level changes in the learning styles of underdeveloped countries have been noted as they become more Westernized (Wagner, Messick, & Spratt, 1978). Halverson (1979) pointed out that students can learn to be bicultural as they go through the process of acculturation. Brown (1980) indicated that for successful learning to take

place there needs to be a synchronization between language development and the process of acculturation.

### **Learning Strategies**

To what extent do students actually follow the dictates of their learning style preferences and to what extent do they adapt to the task at hand? Recent research has shown learning styles, particularly in adults, to be flexible and adaptable behaviors (Davidman, 1981; Galbraith & James, 1984). In light of this Reid (1987) implied that "unconscious or subconscious learning styles can become conscious learning strategies . . ." (p. 101). The second focus of the research was on the degree to which the strategies or techniques that students apply in learning a second language reflects their background and/or perceptual learning style preferences.

Learning strategies have been defined as "any set of operations or steps used by a learner that will facilitate the acquisition, storage, retrieval, or use of information" (O'Malley et al., 1985a). Learning strategies can be contrasted with instructional strategies which are the methods used by teachers to present information (Oxford, 1986a). Research has shown that strategies can be taught and when applied do improve achievement levels (O'Malley et al., 1985b; Oxford, 1986a & b; Weinstein, Schulte, & Cascallar, 1984). Diverse research efforts into the learning strategies of second language learners have surfaced as part of the trend to identify individual differences among learners (Bialystok, 1979; Cohen, 1984; Hosenfeld, 1979; Naiman et al., 1975; O'Malley et al., 1985b; Oxford, 1986b; Rubin, 1975; Wenden, 1986).



Because the learner's self-selection of learning strategies often involves unconscious processes that cannot be objectively measured, there is little overall consensus as to the role of learning strategies in second language acquisition or as to the relationships that exist among identified strategies (O'Malley et al., 1985b). The approaches to learning strategy research have been varied. Beginning with the development of unvalidated lists derived from informal observations (Rubin, 1975; Stern, 1975), researchers have gradually employed more effective measures such as retrospective interviews (Naiman et al., 1975; O'Malley et al., 1985b; Wenden, 1986) and introspective self-reporting surveys that require students to provide immediate oral feedback (Hosenfeld, 1979; O'Malley, Chamot, & Walker, 1987), to keep diaries (Rubin, 1981) or to complete structured questionnaires (Bialystok, 1981; Oxford, 1986b; Ramirez, 1986). To date, the most structured and comprehensive instrument to be developed is the Strategies Inventory of Language Learning (SILL) by Oxford (1987) which was used in this study.

Learning strategies have been commonly classified in two groups—metacognitive and cognitive (O'Malley et al., 1985b; Oxford, 1986). The metacognitive strategies reflect the learner's knowledge of the learning process and are imposed by the learner to regulate his or her learning, such as previewing and self-monitoring. The cognitive strategies refer to operations that relate to specific learning tasks and include reciting, memorizing, and taking notes. Many factors have been identified as contributing to a learner's self-selection of learning strategies including

motivation, aptitude, cognitive maturity and overall learning style (Schmeck, 1983).

However, little has been done to demonstrate the relationship of cognitive learning style to strategy choice (Abraham, 1983). Ehrman and Oxford (1988) showed relationships between learning strategies and the cognitive, affective and social aspects of learning style associated with specific personality types. Miller, Alway & Mckinley (1987) allude to the correlation that exists between learning styles and strategies as evidenced in an assessment of academic achievement. Abraham (1983) explored the relationship between the second language learning strategy of monitoring and field dependence/independence. No studies have been conducted to show the extent to which perceptual style influences a student's choice of strategies.

### **Summary**

The role that perceptual learning style plays within the cognitive domain has not been clearly or consistently delineated. Studies have shown that the way information is perceived, processed and stored varies from one individual to another and is influenced by heredity, environment and past experiences. In both children and adults one of the perceptual styles (auditory, visual, tactile, or kinesthetic) is usually more dominant than the others influencing the way in which information is received. The ongoing attempt to construct a profile of the successful second language learner has led to the consideration of perceptual learning style as a component of the language acquisition process. The preliminary research undertaken by Reid (1987) demonstrated the ways in which sensory mode dominance varies

with native language background pointing to the possible influence of culture on learning style. Another research effort has been launched in the direction of learning strategies, the techniques that students employ to learn a second language. These range from seeking authentic language experiences to memorizing vocabulary words. Whether or not an individual's dominant perceptual style influences his/her strategic approach to language learning has become the basis for this study.

## CHAPTER 3

### Methods and Procedures

Qualitative in nature, the proposed study is structured to assess the perceptual learning style preferences of adult immigrants as they engage in the complex process of acquiring a second language. The characteristics that shape the learner along with the interplay between learning style and learning environment will be studied primarily through the use of structured, self-reporting survey instruments. This chapter will describe the population to be sampled, the instruments and procedures to be used in gathering the data, and the methods to be employed in analyzing the data.

#### **Sample**

The population sampled consisted of adult immigrants of varying linguistic backgrounds studying ESL in urban community college settings. A sample of 147 students, 78 males and 69 females, between the ages of 20 and 52 were selected from two different sources. Seventy-eight ESL students at a midwestern community college and 69 at a northeastern community college participated in the study. The major language groups represented in the sample were Chinese, Laotian, Vietnamese, and Hispanic; smaller numbers of students from Eritrea, Haiti, Brazil Cambodia, Morocco, Japan, Poland, Thailand, Korea, and Czechoslovakia were grouped together as other languages. The English proficiency levels of the participants ranged from low intermediate to advanced with the higher level students having completed three to four semesters of ESL. Immigrant students, unlike most foreign students, are

seeking permanent residence in the United States and do not plan to return to their respective native countries to live. The participants' average length of stay in the United States ranged from a few months to 16 years.

The educational backgrounds of the subjects were varied. While some of the participants completed job training programs, attended college or completed advanced degrees in their native countries, the majority did not receive schooling beyond the secondary level. Most were attending classes to improve their English primarily for purposes of finding employment, of advancing in their current positions, or of entering short-term vocational training programs at community colleges. The diversity of the sample provided a broad perspective on the nature of learning styles and strategies and the factors shaping them.

### **Instrumentation**

The instruments used in the study were designed to gather data in three major areas--(1) learner characteristics, (2) perceptual learning style preferences, and (3) self-selected strategies employed by the student learning a second language. As a means of obtaining descriptive data on the population, such as age, sex, and native language, a questionnaire was developed (see Appendix D). The information obtained provides an overview of each individual's past history and experiences in the United States. The data were used to identify the key factors that might contribute toward the development of perceptual learning styles and second language learning strategies.

The level of English proficiency was measured by the Michigan Test of Language Proficiency, a 100-item, multiple choice test that evaluates

grammar, vocabulary and reading comprehension skills (see Appendix C for instrument). Both the grammar and the vocabulary tests contain 40 items in which students must choose the correct verb form or vocabulary word to complete a given sentence. The reading section consisting of 20 points has four selections each followed by five multiple choice comprehension questions.

Validity and reliability studies have been conducted for the Michigan Test. In terms of content validity, the test measures the knowledge of structure, vocabulary and reading comprehension more than the overall mastery of English. The most important validity data are derived from consecutive administrations of the Test of English as a Foreign Language (TOEFL) and an unpublished form of the Michigan Test to students of varied linguistic backgrounds at four colleges. The correlation coefficient is reported to approximate .80. Predictive validity data consist of a .44 correlation between the Michigan Test and two sets of criteria for academic success--grade point average and course grades. The K-R 21 reliability coefficients for all seven forms of the test are .92 or greater. This figure is based on the scores of six groups of randomly selected applicants of varied language backgrounds applying to colleges in the United States (Cervenka, 1978).

The Perceptual Learning Style Preference Questionnaire developed by Reid (1987) was administered to explore the ways in which different immigrant groups specify their preferred modality for learning (see Appendix B for instrument.) The instrument was chosen because it is the only one of its kind created specifically for adult, non-native speakers of English.

Developed at Colorado State University, the self-reporting questionnaire was patterned after existing learning style instruments, such as the Learning Styles Inventory (LSI) (Dunn, Dunn, & Price, 1987), the Center for Innovative Teaching Experiences (C.I.T.E.). Further justification for use of the instrument comes from research demonstrating that students, particularly educated adults, can accurately predict their dominant learning modalities (Dunn 1984; Farr 1971).

The questionnaire consists of five groups of statements randomly arranged to cover six learning style preferences--visual, auditory, kinesthetic, tactile, individual and group learning. Students respond to each statement on a 5-point scale ranging from "Strongly Agree" to "Strongly Disagree." Reid (1987) reports that the questionnaire was reviewed by "non-native speaker informants and United States consultants in the fields of linguistics, education, and cross-cultural studies" (p. 92). To determine the statements that should be included in the survey, a correlation analysis was performed on 60 statements (10 per modality) randomly arranged in a questionnaire format and administered to 50 ESL students; five statements per group were ultimately included. After giving the new 30-item questionnaire to over 50 students, a correlation analysis of the six subsets was undertaken producing intercorrelation coefficients that ranged between .3966 (visual) to .5467 (group).

The Strategy Inventory for Language Learning (SILL), a self-reporting questionnaire developed by Oxford (1986a) was administered to investigate the strategies used by adult immigrants studying ESL (see Appendix A for instrument). Because so much of the language acquisition process

transpires on a subconscious level, precise documentation of the way in which learners self-select learning strategies is difficult to gather; classroom observations provide little insight into the student's thought processes (Cohen, 1984; O'Malley et al., 1985a; Rubin, 1981). The SILL was chosen for use in this study because it has been designed specifically for assessing second language learning strategies, it provides a comprehensive inventory of strategies derived from previous research and, unlike other instruments, it has been systematically validated. Since the SILL was given while students were in the process of studying a second language, strategy recall should not have been affected significantly by memory lapses.

The overall purpose of the SILL is to assess the frequency with which second language learners use various strategies, both cognitive—those which relate directly to the learning materials—and metacognitive—those which "indirectly support or enhance learning . . ." (Oxford, 1986a, p. 1). The SILL was originally created by Oxford (1986a) for use in the Language Skill Change Project of the U.S. Army Research Institute for the Behavioral and Social Sciences. Based on the second language strategy explorations of researchers such as Bialystok (1981), Naiman et al. (1975), Rubin (1975, 1981), O'Malley et al. (1986a & b), and Weinstein (1978), a comprehensive taxonomy of second language learning strategies was developed and linked to the skill areas of listening, speaking, reading and writing. The result was a survey of 121 items; students respond to each statement on a five-point scale ranging from "never or almost never true of me" to "always or almost always true of me." A revised version (1988) of 80 items with simplified language for ESL students was used in this study. The



strategies are categorized in ten groups (A-J) and students receive a score ranging from 1 to 5 for each category (see Appendix A for category descriptions).

While reliability and validity data have not yet been gathered for the ESL version of the inventory, they do exist for the 121-item edition. As reported in the SILL manual (Oxford, 1987), field tests with a 1,200-person university sample and a 483-person sample at the Defense Language Institute have demonstrated an internal consistency reliability of .96 and .95, respectively, using Cronbach's coefficient alpha. The average reliability per subscale is .69. Content validity coefficients based on ratings of the correspondence between the SILL and the taxonomy items as judged by two raters was .95. Oxford concluded that the SILL has been shown to be "psychometrically stronger than most other self-report learning strategy surveys" (p. 39).

### **Data Collection Procedures**

The data were collected in three stages within a two week period at each of the colleges. The researcher conducted all of the testing sessions to ensure that similar conditions existed at both colleges. The first round of testing was undertaken during the summer session at the northeastern community college; the second round occurred during the fall semester at the midwestern college. A total of 147 students were tested.

The first phase of the data collection process involved the administration of both the questionnaire to gather background information on each student and the language proficiency test consisting of the Michigan Test of Language Proficiency. All subjects were tested on the same day at

each college during an 80-minute session. An overall proficiency level based on a scale of 100 was determined for each student.

The second phase of data collection involved the Learning Style Preference Questionnaire. An introductory session with students divided into small groups by native language was held one day prior to administering the questionnaire in order to familiarize students with the terminology and the thinking process involved in specifying learning style preferences.

Translators comprised of the more advanced students were used as necessary during the training sessions. All subjects took the test at the same time within a 30 minute period. Scores were computed on a 0-20 point scale.

During the third phase of testing, the Strategy Inventory of Language Learning (SILL) was administered to determine the relationship between sensory modality preferences and the learning strategies selected. Again, training sessions with students divided into small groups according to native language were held one day prior to testing. Translators were provided at the sessions as needed. The survey was given to all subjects to complete in approximately 30 minutes. Scores were computed on a 1-5 point scale.

### **Data Analysis**

Two series of null hypotheses were tested in the study; the first group (1-6) related to learning style preferences while the second (7-16) related to language learning strategies. The hypotheses are as follows:

- (1) No relationship exists between the auditory learning style preference of adult, immigrant ESL students and the background variables of age, sex, native language, level of English

proficiency, educational background, period of residence in the United States and work history in the United States.

- (2) No relationship exists between the visual learning style preference of adult, immigrant ESL students and the background variables.
- (3) No relationship exists between the tactile learning style preference of adult, immigrant ESL students and the background variables.
- (4) No relationship exists between the kinesthetic learning style preference of adult, immigrant ESL students and the background variables.
- (5) No relationship exists between the individual learning style preference of adult, immigrant ESL students and the background variables.
- (6) No relationship exists between the group learning style preference of adult, immigrant ESL students and the background variables.
- (7) For the population of adult, immigrant ESL students, no relationship exists between learning strategy group A and either (a) perceptual learning style preferences or (b) the background variables of age, sex, native language, level of English proficiency, educational background, period of residence in the United States and work history in the United States.
- (8) For the population of adult, immigrant ESL students, no relationship exists between learning strategy group B and either

- (a) perceptual learning style preferences or (b) the background variables.
- (9) For the population of adult, immigrant ESL students, no relationship exists between learning strategy group C and either (a) perceptual learning style preferences or (b) the background variables.
- (10) For the population of adult, immigrant ESL students, no relationship exists between learning strategy group D and either (a) perceptual learning style preferences or (b) the background variables.
- (11) For the population of adult, immigrant ESL students, no relationship exists between learning strategy group E and either (a) perceptual learning style preferences or (b) the background variables.
- (12) For the population of adult, immigrant ESL students, no relationship exists between learning strategy group F and either (a) perceptual learning style preferences or (b) the background variables.
- (13) For the population of adult, immigrant ESL students, no relationship exists between learning strategy group G and either (a) perceptual learning style preferences or (b) the background variables.
- (14) For the population of adult, immigrant ESL students, no relationship exists between learning strategy group H and either

- (a) perceptual learning style preferences or (b) the background variables.
- (15) For the population of adult immigrant ESL students, no relationship exists between learning strategy group I and either (a) perceptual learning style preferences or (b) the background variables.
- (16) For the population of adult, immigrant ESL students, no relationship exists between learning strategy group J and either (a) perceptual learning style preferences or (b) the background variables.

Two statistical procedures were used to identify relationships among variables, multiple regression and chi square analyses. A stepwise multiple regression was done to identify the background variables most significantly correlated with learning styles as well as to indicate the interrelationships among learning strategies, perceptual learning style preferences and background characteristics. Because of the existence of considerable nominal data and as a supplement to the regression analysis, two-by-two crosstabulations were also undertaken to determine whether the background characteristics, learning styles and strategies were independent of each other. Scores on both the learning style preference test and the strategy inventory were divided into high and low groups according to median scores for the chi-square analysis.

In addition, descriptive statistics were presented. First, a profile of the sample was provided based on a statistical analysis of the information gathered on the background questionnaire. Second, mean scores and

frequency distributions for the learning styles and strategies tests were given.

### **Summary**

The study was based primarily on an analysis of data derived from self-assessment instruments as a means of determining the perceptual learning style preferences of adult immigrants from a variety of linguistic and cultural backgrounds. The instruments include both standardized and nonstandardized measures for determining levels of language proficiencies, a questionnaire to assess perceptual learning style preferences, and an inventory of learning strategies. The methods and procedures employed in the study involve not only a determination of learning style preferences but also an analysis of the interactions among learning style, background factors, and the selection of learning strategies.

## CHAPTER 4

### The Results

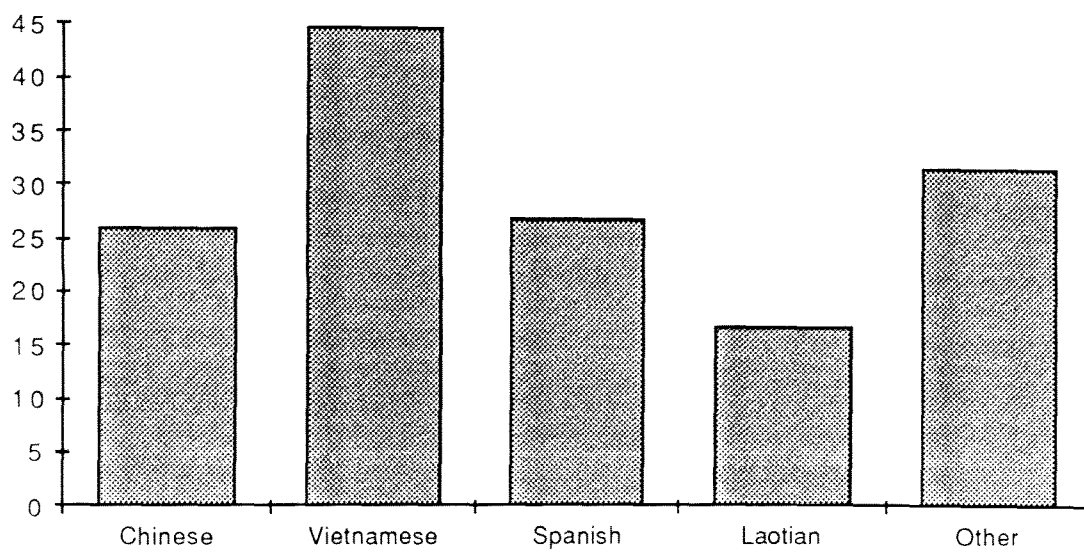
The major focus of the study was to determine the relationship that an individual's background and learning style preferences had to the strategies he/she used when learning a second language. The sample was comprised of 147 adult immigrants studying English in community college settings. To test the null hypotheses stepwise multiple regression and chi-square analysis were performed along with a multivariate analysis of variance (MANOVA) on select variables. Statistical significance was established at  $p < .05$ . Because of the large number of variables being considered, the complexity of their interactions, and the nature of the statistical analyses, the findings consist primarily of significant relationships between specific independent and dependent variables in each of the hypotheses rather than of more global patterns.

#### **Descriptive Statistics**

Statistical analyses produced a composite profile of the sample. Sixty-nine of the 147 adult immigrant students participating in the study were from a community college in New England and 78 subjects were from a community college in the Midwest. The age range of the sample was from 20 to 52 years old with the mean being 28 years old. Of the total population 53.1 percent were females and 46.9 percent were males.

Twenty-four countries were represented in the sample (see Figure 1). The subjects were grouped according to language background and consisted of Chinese (26) from the Republic of China, Taiwan and Hong

Figure 1. Subjects grouped by language background.





Kong; Vietnamese (45) from Vietnam, Spanish (27) from Colombia, Ecuador, El Salvador, Chile, Spain, Mexico, Puerto Rico, Panama and Peru; Laotian (17), from Laos and Other (32) from Eritrea, Haiti, Brazil, Cambodia, Morocco, Japan, Poland, Thailand, Korea, and Czechoslovakia. The average score on the Michigan Test of English Language Proficiency was 47.9 percent indicating an intermediate level of proficiency.

In terms of the education that the subjects obtained in their respective native countries, the range was from 4 to 19 years of schooling with the mean being 11 years. Of the total sample, 31.3 percent had attended college and 68.7 percent had not. Thirty two percent had received some form of job training while 68 percent had not.

Overall, the subjects had spent from 1 month to 16 years in the United States with the average period of time being 3.5 years. Sixty-eight percent had worked or were currently employed in the United States. The period of work duration ranged from 0 to 14 years and averaged 2.5 years.

The most dominant perceptual learning styles were tactile and kinesthetic, both with mean scores of 16. In order of preference, visual learning ranked third with a mean score of 15.5, and auditory was fourth with a mean of 14.4. Group learning with a mean of 15.1 was preferred over individual learning with a mean of 12.4 (see Table 1). In terms of language groups, the Spanish-speaking subjects preferred kinesthetic and auditory learning styles; the Chinese preferred a visual learning style, the Vietnamese, tactile and kinesthetic learning styles, the Laotian, a kinesthetic learning style and the subjects categorized as Other, also kinesthetic.

**Table 1**  
Learning Style Preference Means and Native Language

Language	Learning Style					
	Aud.	Vis.	Tac.	Kin.	Ind.	Grp.
Spanish	15.27	13.32	15.05	15.32	12.05	14.95
Chinese	13.59	16.17	15.76	15.03	12.62	14.21
Vietnamese	13.96	16.13	16.67	16.53	11.93	16.16
Laotian	13.18	15.47	16.18	16.94	12.82	15.18
Other	15.56	15.41	16.06	16.15	13.00	14.41
Population	14.36	15.48	16.05	16.01	12.43	15.07

Note: Preference means 13.50 and above=major preference; means of 11.50-13.49=minor preference; means of 11.49 or less=negative preference.

Social strategies (Group F) with a mean score of 3.8, authentic language use (Group B) and visualization techniques (Group I) both with means of 3.7 were ranked highest of the ten strategies. The strategies used least often were those involving the communication of meaning (Group C) and independent techniques (Group D); both strategy groups had mean scores of 3.4. A breakdown according to language groups shows the following learning strategy selections: Other, F (social strategies); Vietnamese and Laotian, B (authentic language use); Spanish, E (memory strategies) and F; and Chinese, I (visual) and J (formal model building) (see Table 2).

### Hypotheses Testing

The hypotheses focus on two different aspects of the learning process. Hypotheses 1 through 6 deal with perceptual learning style preferences and 7 through 16 with language learning strategies.

#### **Hypothesis (1): Auditory Learning Style Preference**

No relationship exists between the auditory learning style preference of adult immigrant ESL students and the background variables of age,

sex, native language, level of English proficiency, educational background, period of residence in the United States, and work history in the United States.

**Table 2**  
Learning Strategy Means and Native Language

Language	Learning Strategies									
	A	B	C	D	E	F	G	H	I	J
Spanish	3.48	3.65	3.41	3.30	3.86	3.84	3.36	3.67	3.51	3.51
Chinese	3.48	3.46	3.40	3.27	3.40	3.64	3.55	3.56	3.57	3.65
Vietnamese	3.43	3.96	3.40	3.40	3.37	3.82	3.49	3.51	3.89	3.76
Laotian	3.04	3.76	3.26	3.06	3.15	3.69	3.35	3.38	3.44	3.48
Other	3.60	3.63	3.35	3.56	3.66	3.77	3.50	3.63	3.69	3.50
Population	3.44	3.72	3.37	3.36	3.50	3.76	3.47	3.56	3.67	3.60

**Note:** High frequency range = 4.5-5.0; Medium frequency range = 2.5-4.4;  
Low frequency range = 1.0-2.4

The results of a stepwise multiple regression showed a positive correlation between an auditory learning style preference and native language. Subjects who were classified as speakers of other languages ( $r=.25$ ) and those who were identified as Spanish-speakers ( $r=.16$ ) demonstrated a preference for the auditory mode (see Table 3). Of the two variables entered in the regression equation, the category encompassing other languages is the more significant accounting for 6.4 percent of the variability in the auditory learning style. While both languages emerged as statistically significant, the weak correlations limit the predictability of learning style based on the native language variable. The crosstabulation produced no further evidence of significant relationships between the auditory mode and the background variables.

The null hypothesis was rejected at the .05 level of significance based on the findings.

**Table 3**  
Multiple Regression Analysis of Auditory Learning Style and Background Variables

Variables	Mult.R	R Sq.	B	SE B	Beta	T	Sig T
1. Other	.25	.06	1.8	.49	.30	3.7	.0003
2. Spanish	.33	.11	1.5	.57	.22	2.8	.0066
(Constant)			13.7	.26		53.1	.0000
F = 9.0, p = .0002							

### **Hypothesis 2: Visual Learning Style Preference**

No relationship exists between the visual learning style preference of adult, immigrant ESL students and the background variables.

Three variables were entered in the multiple regression equation as potential predictors of visual learning style preference—Spanish ( $r=-.31$ ), English language proficiency ( $r=.21$ ) and age ( $r=.24$ ). The negative correlation between Spanish and the visual mode is the strongest of the three relationships and indicates that the Spanish-speaking subjects did not demonstrate a preference for visual learning (see Table 4). Approximately

**Table 4**  
Multiple Regression Analysis of Visual Learning Style and Background Variables

Variables	Mult.R	R Sq.	B	SE B	Beta	T	Sig T
1. Spanish	.31	.09	-2.6	.66	-.31	-3.9	.0002
2. Proficiency	.42	.17	.07	.02	.29	3.7	.0003
3. Age	.46	.21	.08	.03	.19	2.6	.0102
(Constant)			10.5	1.2		8.5	.0000
F = 12.7, p = .0000							

9.4 percent of the variability in the visual learning style preference can be attributed to Spanish. While the correlations are statistically significant, the

The null hypothesis was rejected at the .05 level of significance based on the findings.

No relationship exists between the tactile learning style preference of adult, immigrant ESL students and the background variables.

The results of a multiple regression analysis show that negative correlations exist between tactile learning style preference and the variables of sex ( $r=-.24$ ) and Spanish as a native language ( $r=-.20$ ). Sex, the more important variable in the equation, contributes 5.4 percent of the variability in the tactile mode (see Table 5). The negative correlations indicate that the males tested demonstrated a preference for tactile learning while the female and Spanish-speaking subjects did not. The weak correlations although statistically significant limit the usefulness of the sex and native language variables as predictors of tactile learning style preference.

**Table 5**  
Multiple Regression Analysis of Tactile Learning Style and Background Variables

[illegible]

A crosstabulation confirmed the relationship between the tactile mode and the sex variable. Table 6 shows a chi-square value of 8.9 ( $p = .0028$ ); in addition, lambda was .15 with tactile learning as the dependent variable, and phi was .25. Of the 78 males, 43.6 percent scored low on the tactile preference scale and 66.7 percent scored high. Of the 69 females, 68.1 percent scored low on the preference scale and 31.9 percent scored high. As was also evidenced in the regression analysis, male subjects preferred tactile learning while female subjects did not. No other variables were identified as being significant in relation to the tactile learning mode.

The null hypothesis was rejected at the .05 level of significance as a result of the findings.

**Table 6**  
Crosstabulation of Tactile Learning Style and Sex

Tactile:	Low	High	Row Total
Sex:			
Male	34 (O) 43 (E) 43.6% (R)	44 (O) 35 (E) 66.7% (R)	78 53%
Female	47 (O) 38 (E) 68.1%	22 (O) 31 (E) 31.9%	69 46.9%
Column Total:	81 55.1%	66 44.9%	
O=Observed E=Expected R=Row			
Chi-square = 8.9 ( $p = .0028$ ) Lambda (Tactile Dependent) = .15 Phi = .25			

#### **Hypothesis 4: Kinesthetic Learning Style Preference**

No relationship exists between the kinesthetic learning style preference of adult, immigrant ESL students and the background variables.

The results of a multiple regression analysis indicate significant correlations between kinesthetic learning style preference and the following background variables--Chinese ( $r=-.18$ ), Spanish ( $r=-.12$ ) and English language proficiency ( $r=.15$ ). The most important variable entered in the regression equation is Chinese as a native language which explains 3.4 percent of the variability in the kinesthetic mode (see Table 7). The negative correlations demonstrate that neither the Chinese nor Spanish-speaking subjects expressed a preference for kinesthetic learning. Although the correlations are statistically significant, they are weak and cannot be used for making predictions in learning style.

**Table 7**  
Multiple Regression Analysis of Kinesthetic Learning Style and Background Variables

Variables	Mult.R	R Sq.	B	SE B	Beta	T	Sig T
1. Chinese	.18	.03	-1.3	.55	-.20	-2.4	.0179
2. Spanish	.24	.05	-1.4	.61	-.19	-2.3	.0242
3. Proficiency	.28	.08	.03	.02	.15	1.8	.0665
(Constant)			15.0	.84		18	.0000
$F = 4.2, p = .0071$							

In a crosstabulation an additional relationship was found between kinesthetic learning style preference and whether or not an individual was employed for any period of time. Table 8 shows a chi-square statistic of 6.67

( $p=.0098$ ); in addition, lambda was .18 with kinesthetic learning style as the dependent variable, and phi was .21. Of the 47 subjects who did not work in the United States, 63.8 percent scored low on the kinesthetic preference scale and 36.2 percent scored high. Of the 100 subjects who worked, 41 percent scored low and 59 percent scored high. The results point to a preference for kinesthetic learning among those subjects who were employed for some period of time. The amount of time that an individual was employed in the United States did not emerge as a significant variable in the multiple regression equation. No other significant relationships were found between the kinesthetic mode and the remaining background variables.

The null hypothesis was rejected at the .05 level of significance as a result of the findings.

**Table 8**  
Crosstabulation of Kinesthetic Learning Style and Work History

Kinesthetic:	Low	High	Row Total
Work History:			
No, Work	30 (O) 22.7 (E) 63.8% (R)	17 (O) 24.3 (E) 36.2% (R)	47 32%
Yes, Work	41 (O) 48.3 (E) 41.0% (R)	59 (O) 51.7 (E) 59.0% (R)	100 68%
Column Total	71 48.3%	76 51.7%	147 100%
O=Observed E=Expected R=Row Percentage			
Chi-square=6.67 ( $p=.0098$ )			
Lambda (Kinesthetic Dependent)=.18			
Phi=.21			



No relationship exists between the group learning style preference of adult, immigrant ESL students and the background variables.

**Table 9**  
Multiple Regression Analysis of Group Learning Style and Background Variables

Variables	Mult.R	R Sq.	B	SE B	Beta	T	Sig.T
1. Vietnamese	.22	.05	1.7	.55	.24	3.0	.0032
2. Proficiency	.27	.08	.04	.02	.16	2.0	.0504
3. Sex	.31	.10	.89	.52	.14	1.7	.0900
Constant			12.7	.99		12.9	.0000

F = 5.02, p = .0024

The null hypothesis was rejected at the .05 level of significance based on the findings.

For the population of adult, immigrant ESL students, no relationship exists between learning strategy group A and either (a) perceptual learning style preferences or (b) the background variables of age, sex, native language, level of English proficiency, educational background, period of residence in the United States, and work history in the United States.

The results of a multiple regression showed that correlations exist between learning strategy group A, which involves the use of general learning strategies and each of the following three variables--kinesthetic learning style preference ( $r=-.22$ ), Laotian ( $r=-.07$ ) and tactile learning style preference ( $r=.01$ ). Approximately 5 percent of the variability in the strategy group can be attributed to the kinesthetic learning style (see Table 10). The

**Table 10**  
Multiple Regression Analysis of Strategy Group A, Perceptual Learning Styles and Background Variables

Variables	Mult.R	R Sq.	B	SE B	Beta	T	Sig. T
1. Kinesthetic	.22	.05	-.08	.03	-.32	-3.1	.0022
2. Laotian	.29	.08	-.38	.17	-.18	-2.2	.0266
3. Tactile	.33	.11	.06	.03	1.9	1.9	.0612
Constant		3.8	.41		9.4		.0000

F = 5.7, p = .0010

negative correlation suggests that subjects who learn kinesthetically do not often engage in the general learning strategies associated with group A. Although statistically significant, the weak correlations make the prediction of learning strategy based on variables impractical.

A crosstabulation confirmed the negative relationship between a subject's use of general learning strategies and a kinesthetic learning style preference. Table 11 shows a chi-square statistic of 5.7 ( $p=.02$ ); lambda was .18 with strategy group A as the dependent variable, and phi was .197. Of the 71 subjects who scored low on the kinesthetic preference scale,

**Table 11**

Crosstabulation of Strategy Group A and Kinesthetic Learning Style

Strategy A:	Low	High	Row Total
Kinesthetic:	29 (O)	42 (O)	71
Low	36.2 (E)	34.8 (E)	48.3%
	40.8% (R)	59.2 (R)	
High	46 (O)	30 (O)	76
	38.8 (E)	37.2 (E)	51.7%
	61.3% (R)	41.7% (R)	
Column Total:	75	45	147
	51%	49%	100%
O=Observed E=Expected R=Row Percentage			
Chi-square = 5.7 ( $p = .02$ )			
Lambda (Strategy Group A Dependent) = .18			
Phi = .197			

40.8 percent also scored low on the group A strategy scale while 52.9 percent scored high. Of the 76 subjects that had high scores on the kinesthetic scale, 60.5 percent scored low on the group A strategy scale while 39.5 percent scored high. Kinesthetic learners do not often use the strategies described in group A. No other statistically significant relationships were found.

The null hypothesis was rejected at the .05 level of significance based on the findings.

### **Hypothesis 8: Learning Strategy Group B**

For the population of adult, immigrant ESL students, no relationship exists between learning strategy group B and either (a) perceptual learning style preferences or (b) the background variables.

Through a multiple regression analysis, correlations were shown to exist between strategy group B which involves the use of authentic language and the variables of tactile learning ( $r=.29$ ), Vietnamese ( $r=.29$ ) individual learning style ( $r=.14$ ), auditory learning ( $r=-.13$ ) and Chinese ( $r=-.22$ ). The variables with the strongest relationship to the strategy group are tactile learning style which explains 8.7 percent of its variability and Vietnamese background accounts for 5.4 percent of the variability (see Table 12). While statistically significant, the relationships are too weak to have substantial predictive value.

**Table 12**

Multiple Regression Analysis of Learning Strategy Group B and Background Variables

Variables	Mult.R	R Sq	B	SE B	Beta	T	Sig.T
1. Tactile	.29	.09	.07	.02	.26	3.3	.0010
2. Vietnamese	.38	.14	.22	.10	.18	2.2	.0322
3. Individual	.41	.16	.04	.01	.19	2.5	.0126
4. Auditory	.44	.19	-.04	.02	-.20	-2.6	.0110
5. Chinese	.47	.22	-.26	.11	-.18	-2.2	.0241
Constant			2.8	.40		7.0	.0000
<hr/>							
F = 7.93, p = .0000							
<hr/>							

The crosstabulation analysis in Table 13 confirms the relationship that exists between the use of authentic language as a learning strategy and the tactile learning style preference. The chi-square statistic is 7.3; in addition,

with learning strategy group B as the dependent variable, lambda was .20, and phi was .22 (see Table 13). Of the 81 subjects in the low range on the tactile scale, 61.7 percent scored low on the group B strategy scale while 38.3 percent scored high. Of the 66 subjects who scored high on the tactile scale, 39.4 percent scored low on the strategy scale while 60.6 percent score high. Based on the findings the use of group B strategies is linked to tactile learning. A possible explanation is that tactile learners prefer hands-on experiences and might lean toward strategies that provide authentic experiences with the language.

**Table 13**

Crosstabulation of Strategy Group B and Tactile Learning Styles

Strategy B:	Low	High	Row Total
Tactile:			
Low	50 (O) 41.9 (E) 61.7% (R)	31 (O) 39.1 (E) 38.3% (R)	81 55.1%
High	26 (O) 34.1 (E) 39.4%	40 (O) 31.9 (E) 60.6%	66 44.9%
Column Total:	76 51.7%	71 48.3%	147 100%
O=Observed E=Expected R=Row Percentage			
Chi-square = 7.3 (p = .0070)			
Lambda (Strategy Group B Dependent) = .20			
Phi = .22			

Although kinesthetic learning style was not a variable that appeared in the regression equation, it did emerge as significant in a crosstabulation (see Table 14). The chi-square statistic is 11.6 (p=.007); with strategy group B as the dependent variable, lambda is .25, and phi is .28. Of the 71 subjects who scored low on the kinesthetic preference scale, 66.2 percent scored low on the strategy group B scale and 33.8 percent scored high. Of

the 76 subjects who scored high on the kinesthetic preference scale, 38.2 percent scored low on the strategy scale and 61.8 percent scored high. The relationship between kinesthetic learning style and strategy group B can be attributed to the kinesthetic learner's preference for active involvement in the learning experience which authentic language use provides. No other statistically significant relationships were demonstrated between strategy group B and learning styles.

The null hypothesis was rejected at the .05 level of significance based on the findings.

**Table 14**

Crosstabulation of Strategy Group B and Kinesthetic Learning Style

Strategy B:	Low	High	Row Total
Kinesthetic:			
Low	47 (O) 36.7 (E) 66.2% (R)	24 (O) 34.3 (E) 33.8% (R)	71 48.7%
High	29 (O) 39.3 (E) 38.2% (R)	47 (O) 36.7 (E) 61.8% (R)	76 51.7%
Column Total:	76 51.7%	71 48.3%	147 100%
O=Observed E=Expected R=Row Percentage			
Chi-square = 11.6 (p = .0007)			
Lambda (Strategy Group B Dependent) = .25			
Phi = .28			

For the population of adult, immigrant ESL students, no relationship exists between learning strategy group C and either (a) learning style preferences or (b) the background variables.

A relationship emerged in the multiple regression analysis between learning strategy group C, which involves the communication of meaning, and each of the following learning style preferences—tactile ( $r=.20$ ), visual ( $r=-.17$ ) and group ( $r=-.15$ ). Tactile learning style, the first and most important variable entered in the equation, accounts for 3.9 percent of the variability in the strategy variable. Second in importance, the visual modality accounts for 5.4 percent of the variability (see Table 15). The findings indicate that subjects who expressed a preference for tactile learning which is characterized by hands-on experience also indicated a preference for group C strategies which involve extracting meaning in as many ways as possible from a conversation. However, those who preferred to learn visually did not employ the strategies in group C with frequency. Although the results are statistically significant, the weak correlations are not a strong basis for making predictions of learning strategy.

**Table 15**  
Multiple Regression Analysis of Learning Strategy Group C, Perceptual Learning Styles and Background Variables

Variables	Mult.R	R Sq.	B	SE B	Beta	T	Sig.T
1. Tactile	.20	.04	.08	.02	.32	3.8	.0002
2. Visual	.31	.09	-.04	.01	-.22	-2.7	.0075
3. Group	.36	.13	-.03	.01	-.20	-2.4	.0171
Constant			3.2	.34		9.4	.0000

F = 7.1, p = .0002

A crosstabulation confirmed the existence of a relationship between visual learning style preference and strategy group C. Table 16 shows the chi-square statistic to be 4.92 ( $p=.03$ ); lambda is .17 with the strategy group as the dependent variable, and phi is .18. Of the 70 subjects who scored low on the visual preference scale, 41.4 percent scored low on the group C strategy scale while 58.6 percent scored high. Of the 77 subjects who scored high on the visual scale, 59.7 percent scored low on the strategy scale and 40.3 percent scored high. The results show the learning strategies in group C were not frequently used by individuals who expressed a preference for the visual mode. No other relationships were found to exist between learning styles and strategy group C.

The null hypothesis was rejected at the .05 level of significance based on the findings.

**Table 16**

Crosstabulation of Learning Strategy Group C and Visual Learning Style Preference

Strategy C:	Low	High	Row Total
Visual:			
Low	29 (O) 35.7 (E) 41.4% (R)	41 (O) 34.3 (E) 58.6% (R)	70 47.6%
High	46 (O) 39.3 (E) 59.7% (R)	31 (O) 37.7 (E) 40.3% (R)	77 52.4%
Column Total	75 51.0%	72 49.0%	147 100%
O=Observed E=Expected R=Row Percentage			
Chi-square=4.9 ( $p=.03$ )			
Lambda (Strategy Group C Dependent)=.17			
Phi=.18			



### Hypothesis 10: Strategy Group D

For the population of adult, immigrant ESL students, no relationship exists between learning strategy group D and either (a) learning style preferences or (b) the background variables.

The results of a multiple regression analysis show a correlation between strategy group D, which involves the use of independent learning techniques, and each of the following variables--individual ( $r=.20$ ) and visual ( $r=-.14$ ) learning style preferences, Laotian background ( $r=-.17$ ) and sex ( $r=-.13$ ). Individual learning style is the first variable entered in the regression equation contributing 4 percent of the variability in strategy group D; the visual mode can explain 4.2 percent of the variability (see Table 17). The positive correlation between the strategy group and individual learning style preference indicates that those subjects who expressed a preference for learning on an individual basis also used the strategies in group D.

**Table 17**

Multiple Regression Analysis of Learning Strategy Group D, Perceptual Learning Styles and Background Variables

Variables	Mult. R.	R Sq.	B	SE B	Beta	T	Sig.T
1. Individual	.20	.04	.06	.02	.27	3.3	.0012
2. Visual	.28	.08	-.05	.02	-.22	-2.6	.0091
3. Laotian	.34	.11	-.36	.16	-.18	-2.3	.0236
Constant			3.4	.29		11.7	.0000
<hr/>							
F = 6.2, p = .0006							
<hr/>							

However, the negative correlations show that subjects who preferred the visual mode did not use the strategies frequently. While the results are statistically significant, for practical purposes the weakness of the correlations limit their predictive value.

In a crosstabulation, a relationship was identified between auditory learning style and strategy group D; however, this relationship did not appear in the multiple regression analysis. The chi-square statistic is 5.04 ( $p=.02$ ); lambda is .13 when the strategy group is the dependent variable, and phi is .19 (see Table 18). Of the 75 subjects whose scores were low on the auditory learning style preference scale, 56 percent also had low scores on the strategy scale and 44 percent had high scores. Of the 72 subjects

**Table 18**  
Crosstabulation of Strategy Group D and Auditory Learning Style

Strategy D:	Low	High	Row Total
Auditory:			
Low	42 (O) 35.2 (E) 56.0% (R)	33 (O) 39.8 (E) 44.0% (R)	75 51.0%
High	27 (O) 33.8 (E) 37.5% (R)	45 (O) 38.2 (E) 62.5% (R)	72 49.0%
Column Total	69 46.9%	78 53.1%	147 100%
O=Observed E=Expected R=Row Percentage			
Chi-Square=5.04 ( $p=.02$ )			
Lambda (Strategy Group D Dependent)=.13			
Phi=.19			

whose scores were high on the auditory preference scale, 37.5 percent had low scores on the strategy scale and 62.5 percent had high scores. The findings show that subjects who demonstrated a preference for learning by listening employed independent learning strategies with some degree of frequency.

Similarly, although a relationship between kinesthetic learning style and strategy group D was not evidenced in the multiple regression analysis, the relationship did emerge in a crosstabulation. The chi-square value is 9.5

( $p=.002$ ); when the strategy group is the dependent variable, lambda is .20, and phi is .25 (see Table 19). Of the 71 subjects who scored low on the kinesthetic preference scale, 33.8 percent scored low on the strategy group D scale and 66.2 scored high. Of the 76 subjects who scored high on the kinesthetic preference scale, 59.2 percent scored low on the strategy scale and 40.8 percent scored high. The results demonstrate that individuals who expressed a preference for learning kinesthetically do not engage in independent learning strategies with frequency. No other relationship between strategy group D and the remaining variables was found to exist.

The null hypothesis was rejected at the .05 level of significance based on the findings.

**Table 19**

Crosstabulation of Learning Strategy Group D and Kinesthetic Learning Style Preference

Strategy D:	Low	High	Row Total
Kinesthetic:			
Low	21 (O) 33.3 (E) 33.8% (R)	47 (O) 37.7 (E) 66.2% (R)	71 48.3%
High	45 (O) 35.7 (E) 59.2%	31 (O) 30.3 (E) 40.8%	76 51.7%
Column Total	69 46.9%	78 53.1%	147 100%
O=Observed E=Expected R=Row Percentage			
Chi-square=9.5 ( $p=.0020$ )			
Lambda (Strategy Group D Dependent)=.20			
Phi=.25			

### Hypothesis 11: Strategy Group E

For the population of adult, immigrant ESL students, no relationship exists between learning strategy group E and either (a) perceptual learning style preferences or (b) the background variables.

As a result of a multiple regression analysis, strategy group E which encompasses memorization techniques was shown to be positively correlated to auditory learning style preference ( $r=.39$ ) and Spanish background ( $r=.26$ ) and negatively correlated to tactile learning style preference ( $r=-.16$ ). The first variable entered in the equation, auditory learning style preference contributes 1.5 percent of the variability in strategy group E with Spanish background contributing 3.8 percent (see Table 20). The results indicate that while subjects who preferred learning aurally also used the strategies in group E frequently, those of Spanish background did not. Many of the strategies in group E involve the use of listening as an aid to memorization. The weak correlations, though statistically significant, are not practically significant for making predictions.

**Table 20**

Multiple Regression Analysis of Learning Strategy Group E, Perceptual Learning Styles and Background Variables

Variables	Mult.R	R Sq.	B	SE B	Beta	T	Sig.T
1. Auditory	.39	.16	1.0	.02	.38	5.0	.0000
2. Spanish	.44	.19	.29	.14	.16	2.1	.0362
3. Tactile	.47	.22	-.05	.02	-.16	-2.1	.0392
Constant			2.1	.28		7.7	.0000
F = 13.2, p = .0000							

A relationship between an auditory learning style preference and strategy group E was evidenced in a crosstabulation. Table 21 shows a chi-square value of 8.5 ( $p=.0035$ ); lambda is .22 when auditory learning is the dependent variable, and phi is .24. Of the 75 subjects that scored low on the auditory preference scale, 57.3 percent scored low on the group E strategy scale and 42.7 percent scored high. Of the 72 subjects scoring low on the

**Table 21**

Crosstabulation of Learning Strategy Group E and Auditory Learning Style Preference

Strategy E:	Low	High	Row Total
Auditory			
Low	43 (O) 34.2 (E) 57.3% (R)	32 (O) 40.8 (E) 42.7% (R)	75 51.0%
High	24 (O) 32.8 (E) 33.3% (R)	48 (O) 39.2 (E) 66.7% (R)	72 49.0%
Column Total	67 45.6%	80 54.4%	147 100%
O=Observed E=Expected R=Row Percentage			
Chi-square=8.5 (p=.0035) Lambda (Strategy Group E Dependent)=.16 Phi=.24			

auditory preference scale, 33.3 percent scored low on the strategy scale and 66.6 percent scored high. The statistics indicate that individuals who expressed a preference for learning aurally also engage in group E strategies.

**Table 22**

Crosstabulation of Learning Strategy Group E and Visual Learning Style Preference

Strategy E:	Low	High	Row Total
Visual			
Low	25 (O) 31.9 (E) 35.7% (R)	45 (O) 38.1 (E) 64.3% (R)	70 47.6%
High	42 (O) 35.1 (E) 54.5% (R)	35 (O) 41.9 (E) 45.5% (R)	77 52.4%
Column Total	67 45.6%	80 54.4%	147 100%
O=Observed E=Expected R=Row Percentage			
Chi-square=5.2 (p=.0220) Lambda (Strategy Group E Dependent)=.10 Phi=.19			

Although a relationship between strategy group E and visual learning style preference was not evidenced in the multiple regression analysis, the relationship did emerge in a crosstabulation. The chi-square statistic is 5.2 ( $p=.02$ ); with the strategy as the dependent variable, lambda is .12, and phi is .19 (see Table 22). Of the 70 subjects who scored low on the visual preference scale, 35.7 percent scored low on the visual scale and 64.3 percent scored high. Of the 77 subjects who scored high on the visual scale, 54.5 percent scored low on the strategy scale and 45.5 scored high. The results point to the selection of memorization techniques among subjects who prefer to learn visually. No other relationships were found to exist.

The null hypothesis was rejected at the .05 level based on the findings.

### **Hypothesis 12: Strategy Group F**

For the population of adult, immigrant ESL students, no relationship exists between learning strategy group F and either (a) perceptual learning style preferences or (b) the background variables.

A positive correlation ( $r=.30$ ) was found to exist between the social strategies characteristic of group F and a preference for group learning as demonstrated in a multiple regression analysis. The only variable entered in the equation, group learning style preference accounts for 8.9 percent of the variation in strategy group F, which involves considerable peer interaction (see Table 23). The weakness of the correlation makes prediction impractical despite the statistical significance. No other relationships were found to exist as a result of the crosstabulation between the strategy group and the remaining variables.



The null hypotheis was rejected at the .05 level of significance based on the findings.

For the population of adult, immigrant ESL students, no relationship exists between learning strategy group H and either (a) perceptual learning style preferences or (b) the background variables.

A multiple regression analysis showed relationships between strategy group H, which involves self-management techniques, and the variables of group learning style ( $r=-.18$ ), language proficiency ( $r=.17$ ), auditory learning style ( $r=.16$ ), and sex ( $r=-.17$ ). The first and most important variable entered in the equation was group learning style which accounts for 3.1 percent of the variability in strategy group H; language proficiency contributes 3.9 percent of the variability (see Table 25). The findings indicate that group learners do not use the self-management strategies consistently while the more English proficient subjects do. Despite the statistical significance of the

**Table 25**  
Multiple Regression Analysis of Learning Strategy Group H, Perceptual Learning Styles and Background Variables

Variables	Mult.R	R Sq.	B	SE B	Beta	T	Sig.T
1. Group	.18	.03	-.04	.01	-.23	-2.8	.0056
2. Proficiency	.26	.07	.01	.00	.21	2.8	.0064
3. Auditory	.33	.11	.04	.02	.20	2.5	.0122
4. Sex	.37	.13	-.17	.09	-.15	-1.9	.0546
Constant			3.3	.36		9.3	.0000

F = 5.5, p = .0004



correlations, the relationships are not strong enough to use as the basis for predicting strategy choice.

Although college background did not appear as a significant variable in the regression equation, a crosstabulation showed a relationship between the strategy group and participation in college. The chi-square value is 5.3 ( $p=.02$ ); with the strategy group as the dependent variable, lambda is .17, and phi is .19 (see Table 26). Of the 101 subjects who did not attend college in their respective native countries, 57.4 percent scored low on the strategy group H scale and 42.6 percent scored high. Of the 46 subjects who did attend college, 37.0 percent scored low on the strategy scale and 63 percent

**Table 26**  
Crosstabulation of Strategy Group H and College Background

Strategy H:	Low	High	Row Total
College:			
No	58 (O) 51.5 (E) 57.4% (R)	43 (O) 49.5 (E) 42.6% (R)	101 68.7%
Yes	17 (O) 23.5 (E) 37.0% (R)	29 (O) 22.5 (E) 63.0% (R)	46 31.3%
Column Total	75 51.0%	72 49.0%	147 100%
O=Observed E=Expected R=Row Percentage			
Chi-square=5.30 ( $p=.02$ )			
Lambda (Strategy Group H Dependent)=.17			
Phi=.19			

scored high. The findings indicate that subjects who have participated more extensively in the learning process tend to use self-management techniques when studying a second language.

The null hypothesis was rejected at the .05 level based on the findings.

### Hypothesis 15: Strategy Group I

For the population of adult, immigrant ESL students, no relationship exists between learning strategy group I and either (a) perceptual learning style strategies or (b) the background variables.

Through a multiple regression analysis, correlations were found between strategy group I, which encompasses visualization techniques, and the following variables-- visual learning style ( $r=.42$ ), English language proficiency ( $r=.35$ ), period of time in the United States ( $r=-.15$ ) and Vietnamese background ( $r=.20$ ) (see Table 27). The two most important

**Table 27**

Multiple Regression Analysis of Learning Strategy Group I, Perceptual Learning Styles, and Background Variables

Variables	Mult.R	R Sq.	B	SE B	Beta	T	Sig.T
1. Visual	.41	.17	.08	.02	.33	4.5	.0000
2. Proficiency	.49	.24	.02	.00	.31	4.2	.0000
3. Time in USA	.53	.28	.00	.00	-.18	-2.5	.0130
4. Vietnamese	.55	.30	.26	.11	.16	2.2	.0271
Constant			1.7	.30		.5	.0000

variables entered in the regression equation are visual learning style which explains 17 percent of the variability in strategy group I and English language proficiency which accounts for 7.2 percent of the variability. According to the findings, subjects who used visualization techniques also indicated a preference for visual learning style and had higher language proficiency scores.

The relationship between strategy group I and visual learning style also emerged in a crosstabulation analysis. The chi-square statistic is 20.7 ( $p=.0000$ ); lambda is .37 when strategy group I is the dependent variable. Phi is .37 indicating a 37 percent reduction of error (see Table 28). Of the 70

subjects who scored low on the visual learning style scale, 70 percent also scored low on the I strategy scale while 30 percent scored high. Of the 77 subjects who scored high on the visual learning scale, 32.5 percent scored low on the strategy scale and 67.5 percent scored high. The results which are highly significant demonstrate that subjects who preferred a visual learning style used visualization strategies.

**Table 28**

Crosstabulation of Learning Strategy Group I and Visual Learning Style

Strategy I:	Low	High	Row Total
Visual:			
Low	49 (O) 35.2 (E) 70.0% (R)	21 (O) 34.8 (E) 30.0% (R)	70 47.6%
High	25 (O) 38.8 (E) 32.5% (R)	52 (O) 38.2 (E) 67.5% (R)	77 52.4%
O=Observed E=Expected R=Row Percentage			
Chi-square=20.7 (p=.0000)			
Lambda (Strategy Group I Dependent)=.37			
Phi=.37			

Although not evidenced in the multiple regression analysis, other relationships were found through crosstabulations. A relationship was revealed between strategy group I and the job training variable. The chi-square statistic is 4.5 ( $p=.03$ ); lambda is .09 when strategy group I is the dependent variable, and phi is .17 (see Table 29). Of the 100 subjects who did not receive job training in their respective native countries, 57 percent scored low on the strategy I scale and 43 percent scored high. Of the 47 subjects who received job training, 38.3 percent scored low on the strategy scale and 61.7 percent score high. The findings indicate that subjects with

job training used the visualization strategies characteristic of group I while those without job training did not.

**Table 29**  
Crosstabulation of Strategy Group I and Job Training

Strategy I:	Low	High	Row Total
Training:			
No	57 (O) 51 (E) 57.0% (R)	43 (O) 49 (E) 43.0% (R)	100 68.0%
Yes	18 (O) 24 (E) 38.3% (R)	29 (O) 23 (E) 61.7% (R)	47 32.0%
O=Observed E=Expected R=Row Percentage			
Chi-square=4.5 (p=.03)			
Lambda (Strategy Group I Dependent)=.15			
Phi=.17			

Similarly, a relationship emerged in a crosstabulation between strategy group I and the college education variable. The chi-square statistic is 7.1 (p=.008); with the strategy group as the dependent variable, lambda is .12, and phi is .22 (see Table 30). Of the 101 subjects who did not attend

**Table 30**  
Crosstabulation of Strategy Group I and College Background

Strategy I:	Low	High	Row Total
College:			
No	59 (O) 51.5 (E) 58.4% (R)	42 (O) 49.5 (E) 41.6% (R)	101 68.7%
Yes	16 (O) 23.5 (E) 34.8% (R)	30 (O) 22.5 (E) 65.2% (R)	46 31.3%
Column Total	75 51.0%	72 49.0%	147 100%
O=Observed E=Expected R=Row Percentage			
Chi-square=7.1 (p=.008)			
Lambda (Strategy Group I Dependent)=.19			
Phi=.22			

college, 58.4 percent scored low on the strategy group I scale and 41.6 percent scored high. Of the 46 subjects who attended college, 34.8 percent scored low on the strategy scale and 65.2 percent scored high. The findings indicate that subjects who attended college engaged visualization strategies. No other relationships were evidenced.

The null hypothesis was rejected at the .05 level of significance as a result of the findings.

### **Hypothesis 16: Strategy Group J**

For the population of adult, immigrant ESL students, no relationship exists between learning strategy group J and either (a) perceptual learning style preferences or (b) the background variables.

A multiple regression analysis indicated correlations between strategy group J, which refers to language model building, and the following variables-- individual learning style preference ( $r=.21$ ), Vietnamese background ( $r=.20$ ), English language proficiency ( $r=.15$ ), and period of residence in the United States ( $r=-.13$ ). Individual learning style preference, the first variable entered in the equation, accounts for 4.5 percent of the variability in strategy group J, and Vietnamese background explains 5.0 percent of the variability, English language proficiency, 2.7 percent and period of time living in the United States, 2.3 percent (see Table 31). The weak correlations while statistically significant make prediction of learning strategy based on the independent variables impractical.

A crosstabulation confirmed the relationship between strategy group J and individual learning style preference. The chi-square statistic is 6.6 ( $p=.01$ ); lambda is .17 when the strategy group is the dependent variable,

and phi is .21 (see Table 32). Of the 73 subjects who scored low on the individual learning style preference scale, 63 percent scored low on the strategy group J scale and 37 percent scored high. Of the 74 subjects who scored high on the learning style scale, 41.9 percent scored low and 58.1 percent scored high. The findings indicate that those subjects who prefer to learn on an individual basis also engage in language model building which involves considerable independent thinking. No other relationships between strategy group J and the remaining variables were evidenced.

The hypothesis was rejected at the .05 level of significance as a result of the findings.

**Table 31**

Multiple Regression Analysis of Learning Strategy Group J, Perceptual Learning Styles and Background Variables

Variables	Mult.R	R Sq.	B	SE B	Beta	T	Sig.T
1. Individual	.21	.05	.04	.01	.25	3.2	.0019
2. Vietnam	.31	.10	.27	.09	.23	2.9	.0043
3. Proficiency	.35	.12	.00	.00	.18	2.3	.0243
4. Time in USA	.38	.15	-.00	.00	-.15	-2.0	.0531
Constant			.27	.24		11.04	.0000

---

F = 6.03, p = .0002

**Table 32**

Crosstabulation of Learning Strategy Group J and Individual Learning Style

Strategy J:	Low	High	Row Total
Individual			
Low	46 (O) 38.2 (E) 63.0% (R)	27 (O) 34.8 (E) 37.0% (R)	73 49.7%
High	31 (O) 38.8 (E) 41.9% (R)	43 (O) 35.2 (E) 58.1% (R)	74 50.3%

---

O=Observed E=Expected R=Row Percentage

---

Chi-square=6.6 (p=.01)  
 Lambda (Strategy Group J Dependent)=.17  
 Phi=.21

### **Residual Analysis**

A study of the residuals produced by the multiple regression analyses for both learning styles and strategies did not yield a consistent pattern. The observed values were compared with the predicted values; the standardized residual values (ZRESIDS) of 2.5 or above were identified and the cases associated with them were analyzed. Overall, the residuals represent individual deviations from the values predicted by the model and do not contribute significantly to the data on learning styles or strategies.

The histograms charting the residuals from the regression analyses of visual, tactile, kinesthetic, and group learning styles respectively (individual learning style did not emerge as significant) show a slight positive skewness. The curve for auditory learning is relatively normal. Most of the extreme cases have negative standardized residual values indicating that the scores were considerably lower than predicted by the model. In addition, the dichotomous nature of the background variables correlated with auditory and tactile learning styles produced clusters of values on the normal probability plots and strips on the standardized scatterplots. For all five variables the plots did not reveal any violations of the normality assumptions.

Similarly, the residuals associated with the multiple regression analyses for the learning strategies did not emerge in a consistent pattern. For the most part, the residuals represent individual deviations from the values predicted by the model. In general, the normal probability plots and scatterplots for the learning strategies do not reveal any violations of the

normality assumptions. The distribution of residuals for strategy groups A, E, and G show a slight positive skewness, for groups C, H, and J, a slight negative skewness and for B, D, F, and I, a normal curve. No residuals with a value of 2.5 or greater were associated with strategy group D. The outliers were not found to be significant for any of the learning strategies.

### **Multivariate Analysis of Variance**

A global view of the key variables that influence perceptual learning style preference and the selection of language learning strategies emerged as a result of a multivariate analysis of variance (MANOVA) of the data. Not all of the variables associated with the two groups of hypotheses were entered into the analysis. Rather variables that were identified consistently as significant in previous statistical analyses became the focus of the MANOVA. The purpose was to provide a broader view of the interrelationships among independent and dependent variables in each group of hypotheses.

### **Hypotheses 1-6: Perceptual Learning Styles**

The variables of native language, sex, age and level of English proficiency were viewed in relation to auditory, visual, tactile and kinesthetic learning styles. A multivariate analysis of the effect of the covariates, age and level of English proficiency, on learning styles revealed a significant relationship (Wilks lambda=.82;  $p=.001$ ). The univariate analysis showed the relationship to be primarily in the area of visual learning style ( $F=10.53$ ;  $p=.000$ ). For this dependent variable, the significance probabilities were .025 for age and .000 for level of proficiency (see Table 33). The findings



indicate that in general older subjects and those who were more proficient in English were more likely to express a preference for visual learning.

**Table 33**

Relationship of Age and Language Proficiency to Perceptual Learning Styles

Multivariate Test of Significance					
Wilks Lambda=.82 (p=.001)					
Univariate F Tests					
Variable	Mult.R	R Sq.	F	Sig F	
Visual	.37	.13	10.5	.000	
Auditory	.16	.03	1.8	.162	
Tactile	.03	.00	.08	.926	
Kinesthetic	.20	.04	2.8	.065	
Univariate Analysis: Visual Learning Style					
Covariate	B	Beta	SE B	t value	Sig.t
Age	.08	.18	.03	2.2	.03
Proficiency	.07	.31	.02	3.9	.00

The interaction of native language and sex produced no significant effect on an individual's preferred mode of learning (Wilks lambda=.86,  $p=.201$ ). However, the main effects of each of the variables were significant. The effect of language background on learning style preference obtained from the MANOVA was significant (Wilks lambda =.64,  $p=.000$ ). In addition, the univariate analysis showed that a subject's language background had a significant relationship to all four perceptual learning styles. The findings indicate that the variations in the perceptual learning style mean scores can be attributed to language background. Table 34 shows significance probabilities of .000 for visual learning style, .000 for auditory learning style, .038 for tactile learning style and .043 for kinesthetic. Similarly, the effect of

sex on learning style preferences obtained from the MANOVA was found to be significant (Wilks lambda=.91;  $p=.012$ ). The univariate analysis disclosed the the relationship of sex to tactile learning style preference ( $p=.031$ ), but not to any of the remaining 3 styles (see Table 35). Overall, the normal probability plots did not reveal violations of the normality assumption (see Appendix F). The outliers represented individual cases that could not be accounted for by the model. No significant pattern of outliers emerged. The results of the MANOVA confirm on a more general level the significant findings evidenced in the multiple regression and chi-square analyses for the first set of hypotheses.

**Table 34**

Relationship of Language Background to Perceptual Learning Styles

Multivariate Test of Significance Wilks Lambda=.64 ( $p=.000$ )		
Univariate F Tests: Language Background Variable	F Value	Sig. F
Visual	5.6	.000
Auditory	5.7	.000
Tactile	2.6	.038
Kinesthetic	2.5	.043

**Table 35**

Relationship of Sex to Perceptual Learning Styles

Multivariate Test of Significance Wilks Lambda=.91 ( $p=.012$ )		
Univariate F Tests: Sex Variable	F Value	Sig. F
Visual	3.1	.079
Auditory	.20	.649
Tactile	4.7	.031
Kinesthetic	.02	.890

### **Hypotheses 7-16: Language Learning Strategies**

The MANOVA focused on the interplay of learning strategies A through J with both the four perceptual learning styles (auditory, visual, tactile and kinesthetic) as covariates and the background variable of native language. Native language was chosen because of its significance in previous studies.

The multivariate analysis of the effect of perceptual learning style preferences on the learning strategy groups (A-J) was significant. (Wilks lambda=.37;  $p=.000$ ). In addition, the univariate analysis showed relationships to exist between 7 of the 10 learning strategies and select learning styles (see Table 36).

A negative relationship was evidenced between strategy group A ( $F=3.4$ ;  $p=.011$ ) and kinesthetic learning style preference ( $p=.003$ ) indicating that subjects who learned kinesthetically did not frequently use the general learning strategies characteristic of group A.

A negative relationship was also shown to exist between strategy group B ( $F=4.4$ ,  $p=.002$ ) and auditory learning style preference ( $p=.031$ ) indicating that subjects who learned aurally did not actively engage in authentic language use.

For strategy group C ( $F=3.9$ ,  $p=.005$ ), two effects were demonstrated. The first showed a negative relationship with visual learning style preference ( $p=.009$ ) and the second a positive relationship with tactile learning style ( $p=.006$ ). While most of the visual learners surveyed did not use the communication strategies in group C, tactile learners did.

**Table 36**

Relationship of Perceptual Learning Styles and Language Learning Strategies

Multivariate Test of Significance Wilks Lambda .37 (p=.000)		
Univariate Analysis: Strategies and Styles (p < .05)		
Strategy	Overall Relationship (F,p values)	Significant Styles (t,p values)
A (F=3.43, p=.011) (Significant)	Kinesthetic	(t=-3.00, p=.003)
B (F=4.36, p=.002) (Significant)	Auditory	(t=-2.18, p=.031)
C (F=3.86, p=.005) (Significant)	Visual	(t=-2.67, p=.009)
D (F=2.82, p=.027) (Significant)	Tactile	(t=2.78, p=.006)
E (F=4.96, p=.001) (Significant)	Auditory	(t=2.06, p=.042)
F (F=1.9, p=.108) (Nonsignificant)		
G (F=2.06, p=.089) (Nonsignificant)		
H (F=2.51, p=.045) (Significant)	Auditory	(t=4.22, p=.000)
I (F=8.00, p=.000) (Significant)	Tactile	(t=2.28, p=.024)
J (F=.30, p=.874) (Nonsignificant)	Kinesthetic	(t=-2.46, p=.015)
	Visual	(t=4.56, p=.000)

Strategy group D (F=2.82, p=.027), showed a positive relationship with auditory learning style preference (p=.042) indicating that subjects who learned aurally relied on more independent strategies.

Learning strategy group E (F=4.96, p=.001) showed a positive relationship to auditory learning style preference (p=.000). The findings show that the auditory learners engaged in group E memory strategies with frequency.

Learning strategy group H (F=2.5, p=.045) demonstrated a positive relationship with tactile learning style preference (p=.024) and a negative relationship with kinesthetic learning style preference (p=.015). The results

indicate that the tactile learners used self-management techniques while the kinesthetic learners did not.

Finally, a positive relationship was shown to exist between learning strategy group I ( $F=8.00$ ,  $p=.000$ ) and visual learning style preference ( $p=.000$ ) indicating that subjects who preferred to learn visually actually used visualization strategies to learn a second language.

The normal probability plots did not reveal violations of the normality assumption (see Appendix F). The residuals were individual deviations from the model and did not fall into a general pattern. Overall, the results of the MANOVA were consistent with findings in the multiple regression and chi-square analyses for the second set of hypotheses.

### **Summary**

Through multiple regression and chi-square analyses, relationships were found to exist among variables in each of the sixteen hypotheses with the exception of the one dealing with individual learning style. The strongest correlation existed between visual learning and visualization strategies. However, the majority of correlations associated with the hypotheses for both learning styles and strategies, while statistically significant, were weak and limited the degree to which predictions could be made. Tables 37 and 38 summarize the significant relationships.

**Table 37**

Summary of Significant Relationships between Perceptual Learning Styles and Background Variables (Hypotheses 1-6)

Hypothesis	Background Variables
1. Auditory	Other Languages, Spanish
2. Visual	Spanish (negative) English Proficiency Age
3. Tactile	Sex (negative) Spanish (negative)
4. Kinesthetic	Chinese, Spanish (negative) English Proficiency Work History
5. Individual	No relationships found
6. Group	Vietnamese English Proficiency Sex

**Table 38**

Summary of Significant Relationships between Learning Strategy Groups, Learning Styles and Background Variables (Hypotheses 7-16)

Hypothesis	Learning Style	Background Variable
7. Strategy A	Kinesthetic (negative) Tactile	Laotian (negative)
8. Strategy B	Tactile Auditory (negative) Kinesthetic Individual	Vietnamese Chinese (negative)
9. Strategy C	Visual (negative) Tactile Group (negative)	
10. Strategy D	Individual Visual (negative) Auditory Kinesthetic (negative)	Laotian (negative) Sex (negative)
11. Strategy E	Auditory Tactile (negative) Visual	Spanish
12. Strategy F	Group	
13. Strategy G	Visual (negative)	Spanish (negative)
14. Strategy H	Tactile Kinesthetic (negative) Auditory Group (negative)	Sex (negative) Proficiency College
15. Strategy I	Visual Time in USA (negative) Vietnamese Job Training College	Proficiency
16. Strategy J	Individual Proficiency Time in USA (negative)	Vietnamese

## CHAPTER 5

### Summaries, Conclusions, Implications

Current research efforts in second language acquisition have focused on an exploration of the individual differences that exist among second language learners in order to better understand the factors that shape the language learning process. An overview of the research shows perceptual learning style to be a neglected yet significant factor in second language learning. As a result, this study was designed for the purpose of investigating the role that perceptual learning style preferences have in determining language learning behaviors as manifested in the strategic approaches that students take.

Two areas were researched using a sample of 147 adult immigrants studying ESL in community college settings. The first area of study concerned the interrelationships between an individual's dominant learning style (auditory, visual, tactile, kinesthetic, individual or group) and characteristics such as native language that shape his/her background. This aspect of the study built upon the preliminary learning style research undertaken by Reid (1987) and extended the data base to include immigrant groups. The data was gathered using a questionnaire to obtain descriptive information, the Michigan Test of English Language Proficiency and the Perceptual Learning Style Preference Questionnaire developed and used by Reid (1987) (see Appendixes B, C, & D for instruments). The second area of investigation focused on the interplay of perceptual learning styles, background variables and language learning strategies. This phase of the



study drew upon the extensive research efforts of Oxford (1986a & b) in the area of learning strategies and involved the use of the Strategy Inventory of Language Learning (Oxford 1987) (see Appendix A). Through multiple regression, chi-square and multivariate analyses significant relationships were identified among background characteristics, perceptual learning styles and language learning strategies.

### **Discussion of the Findings**

Overall, the study demonstrated that an individual's background and learning style preference influence the types of learning strategies that he/she will employ in acquiring a second language. The first set of hypotheses speculated that relationships existed between perceptual learning style preferences and factors in the learner's background namely age, sex, native language, level of English proficiency, educational background, period of residence in the United States, and work history. The second set of hypotheses focused on the influence of both sensory mode preferences and the learner's background on strategy use. In both cases, significant relationships were identified among select variables demonstrating the potential effect learning styles and strategies have on second language learning.

A global view of the findings related to learning styles shows that the majority of the subjects expressed a preference for the tactile and kinesthetic modes which involve a practical, experiential approach to learning. Reid (1987) found the identical styles to be the major preference among the foreign students tested. The results suggest that second language learners prefer a style of learning that will involve them in the totality of the language

learning experience. A parallel finding exists in the research involving American children. In some studies the kinesthetic mode remained dominant until the children entered school and reading skills were developed. Second language learners might also need realistic contexts and interactive behavior as a basis for their language development.

The most consistent relationship was evidenced between language background and dominant perceptual mode. The learner's native language background was shown to have an effect on his/her perceptual learning style preference, a result that supports Reid's findings (1987). If native language is viewed as one aspect of the broader classification of cultural background, then it is not surprising to find similarities in the way people from particular language groups process sensory information and communicate their perceptions. Spanish speakers, for example, expressed a preference for auditory learning perhaps as a result of the strong oral tradition that is part of the Hispanic culture (Bennett, 1979). Chinese subjects, on the other hand, demonstrated a preference for visual learning, possibly due to the pictorial nature of their written language (Lee, 1976).

More specific relationships between styles and background variables were also evidenced. For example, it was demonstrated that a preference for visual learning is influenced by age and level of English proficiency. These findings corroborate the results of earlier research with both American and foreign adults indicating that older students and those at higher levels of English proficiency prefer the visual mode (Cherry, 1981; Galbraith & James, 1984; Keefe, 1987; Reid, 1987). Studies of Americans disclose a shift toward the visual mode as individuals mature and learn to read (Keefe,

1987; Price et al., 1981). Similarly, the more proficient language learner has probably had more exposure to the written word, and therefore, feels comfortable learning visually.

In the area of tactile learning, sex appeared as a significant variable. Male subjects across all language groups demonstrated a greater preference for tactile, learning experiences than did female subjects. One possible reason for this finding is that some of the cultures represented might encourage men to engage in the hands-on, model-building behaviors associated with tactile learning and might discourage women in this regard.

Kinesthetic learning, which was identified as the dominant preference of the sample, was shown to have a relationship to many of the background variables. First, negative correlations were evidenced between the kinesthetic mode and both the Chinese and Spanish language groups. The negative correlations are contrary to the findings of Reid (1987) indicating a possible difference in the preferences of foreign students and adult immigrants of the same language groups. Second, positive relationships were found to exist between language proficiency and work history. The more proficient students preferred learning through interactive methods and direct experiences with the language. Similarly, those who worked in the United States for any period of time expressed a preference for kinesthetic learning style possibly because they were accustomed to the work environment which provides a more experiential basis for learning than the classroom.

Group learning was preferred over individual learning for which no relationships were identified. Group preferences were associated with the Vietnamese language background, with sex (females being more group-oriented than males) and with those at higher levels of English proficiency. The tie to proficiency indicates that individuals who are more fluent and more confident in their language skills would probably desire the opportunity to use English in real contexts with their peers. The results of Reid's study (1987) showed a preference for individual learning over group pointing to a difference in orientation between foreign students who might feel the pressures of academic competition and adult immigrants, many of whom might desire group interactions as preparation for the work setting.

The learning strategy groups most frequently selected as being used by the second language learners in this study were groups F (social strategies), B (authentic language use) and I (visualization). Relationships were observed between the three strategy categories and both the background characteristics of the subjects and their learning styles. Strategy group F, for example, showed a positive correlation with group learning style preference indicating that those who favored group study utilized social and interactive strategies, such as working with peers, seeking clarification, and asking for correction.

Strategy group B was positively correlated with tactile, kinesthetic, and individual learning styles and Vietnamese language background; it was negatively correlated with auditory learning and Chinese. Authentic language use, characteristic of group B strategies, involves seeking out native speakers, engaging others in conversation and using language as

much as possible within meaningful contexts. The experiential nature of the strategies would make them appealing to tactile and kinesthetic learners who tend toward direct involvement with the subject matter being learned. However, it is difficult to account for the positive relationship between individual learning and the more interactive group B strategies other than to recognize the role of the individual in shaping authentic language experiences. The fact that auditory learning involves more passive strategies such as listening to tapes or repeating new vocabulary orally to oneself might explain the negative correlation. The positive relationship to Vietnamese may be due to the language group's preference for the kinesthetic mode while the negative relationship to Chinese is reflected in the negative correlation between Chinese and kinesthetic learning.

Strategy group I was shown to have positive relationships to visual learning style, Vietnamese, job training, and college background as well as a negative relationship to period of residence in the United States. A rationale can be found for the positive relationships. First, the highly visual nature of the specific strategies which include forming mental images and drawing pictures of new words accounts for the strong link to visual learning style. Second, although the visual mode was not the strongest preference of the Vietnamese subjects, the overall group mean was high accounting for the positive relationship. Finally, the tie between job training and college background to the visual mode has a basis in other research findings which show education and the acquisition of reading and writing skills to be contributing factors in an individual's shift from a kinesthetic orientation to a more visual one (Keefe, 1987; Price et al., 1981).

The negative relationship between the visual style and the length of time that an individual has lived in the United States is difficult to account for particularly since some studies have shown American adults to be visually oriented (Cherry, 1981; Galbraith & James, 1984; Keefe, 1987). Reid (1987) has shown that American students prefer the auditory mode and that students who have been in the United States over three years demonstrate lower preference scores for the tactile, kinesthetic and visual styles. As a result, she speculates on the adaptation of learning styles among nonnative speakers the longer they are exposed to the host culture. The negative relationship may reflect a process of transition among individuals who have resided in the United States for longer periods of time.

The strategy groups identified as being selected least frequently were C (searching for and communicating meaning) and D (independent strategies). Relationships were observed between the strategy groups and both background characteristics and learning style preferences. Strategy group C which incorporates the use of text markers to aid comprehension and of gestures to further communication was positively correlated with tactile learning style and negatively correlated with visual and group learning. The fact that the strategies involve an interaction with and manipulation of the subject matter might account for their appeal to tactile learners. Elements of visual and/or group learning do not seem to be a part of the strategies possibly resulting in the negative relationships.

Strategy group D, which encompasses independent strategies such as reading aloud to oneself, using a tape recorder and listing new words, holds a positive relationship to individual, auditory and kinesthetic learning

styles and a negative relationship to the visual mode. While the predominant focus is on methods that the learner can use independently, the diversity of the strategies in the D category might account for its broad range of relationships. For example, reading aloud can be done on an individual basis by auditory learners. Similarly, the listing of new words, also an individual learning technique, would attract kinesthetic learners who need to interact with the subject matter. However, a question remains as to why a negative relationship exists between the strategy group and visual learning. In terms of background characteristics, the strategy group was negatively correlated with the sex variable (female) and with Laotian.

Of the remaining strategy categories, group A showed a negative correlation to both kinesthetic learning style and Laotian background and a positive relationship to tactile learning. The specific techniques classified as general learning strategies for reading include previewing lessons, managing study time, arranging the study environment, and assessing one's performance. Because of the extremely broad range of methods, it is difficult to form meaningful generalizations about the relationships with learning styles.

Strategy group E, which involves memorization techniques, such as using rhyme, flashcards, and phonetic markers, showed positive relationships with auditory and visual learning style preferences, respectively, and a negative relationship with tactile learning style. Most of the strategies consist of visual and auditory elements rather than tactile, hands-on experiences accounting for the nature of the relationships. The

results showed that Spanish-speaking subjects made the greatest use of the memorization strategies.

The relationships emerging between strategy group G and the variables of learning style and background did not appear to be meaningful. First, the affective nature of the strategies, which involve dealing with feelings toward language learning and overcoming anxieties, is difficult to link to perceptual modes of processing environmental stimuli. Second, only one statement in the inventory was related to the strategy limiting the range of responses. Negative correlations were evidenced between the strategy group and both visual learning style and Spanish language background. However, a meaningful rationale for the relationships is difficult to construct.

The self-management techniques included in strategy group H, such as motivating oneself and setting goals, were related to several variables. However, because of the abstract nature of the strategies, the rationale for the relationships is not always apparent. While positive relationships were found between the strategy group and both tactile and auditory learning styles, negative relationships emerged with kinesthetic and group styles. Self-management methods involve considerable independent thinking accounting for the negative relationship to group learning. However, given the similarity of tactile and kinesthetic learning styles, it is difficult to understand why the correlations were not similar. The place of auditory learning, which was positively correlated, is also difficult to discern. In terms of background characteristics, females reported using the strategy less frequently than males. In addition, subjects who had attended college and



who were more proficient in English reported utilizing self-directed learning methods perhaps as a result of their familiarity with the learning process.

Strategy Group J focuses on formal model building such as developing a model of the language structure, applying grammar rules and identifying patterns in the new language. The strategy group was found to be positively correlated with individual learning style, Vietnamese, and level of English proficiency and to be negatively correlated with the period of time spent in the United States. The link to individual learning style preference and level of proficiency reflects the self-directed nature of the model building strategies and the awareness of language that comes with higher levels of proficiency. The Vietnamese subjects indicated a frequent use of the strategy group. Finally, the subjects who had resided in the United States for longer periods of time used the strategy less, perhaps because the need to construct formal models diminishes as individuals interact more naturally in the host culture.

### **Implications**

The results of this study support and contribute to research on the perceptual learning style preferences of adult non-native speakers of English and on the strategies ESL students use in acquiring a second language. The study's most significant contribution lies in the analysis of the relationships that exist among perceptual learning styles, learner characteristics and language learning strategies, an area that has to date not been explored. The findings have implications for theories of second language development, for future research and for classroom and curricular applications.

The theoretical implications of this study relate primarily to factors that influence the process of learning a second language. As the findings demonstrate, ESL students from different language backgrounds and by extension different cultural backgrounds vary in their strategic approaches to language learning in part due to a diversity in their perceptual learning style preferences. In addition to native language and culture, characteristics of the learner such as age, sex, and work history interact with learning styles to shape learning behaviors. A complex system of variables, unique to specific cultural groups and individuals within those groups, is constantly at work influencing the learning strategies they choose as well as their success or failure as language learners. The different ways in which stimuli are perceived and processed as individuals are exposed to a new language system help determine the strategies that will become basis for the language learning process. Perceptual style, once neglected as a factor in language learning, emerged in this study as an important element to consider when constructing a theoretical model of how language is acquired.

The findings of this study bring to light instructional and curricular implications. First, language learners should be made aware of their perceptual style dominance in order for them to participate more actively and effectively in their own language development. An appreciation of perceptual learning style preferences can help ESL students, particularly self-directed adults, make appropriate strategy choices and enhance their own learning process. Second, ESL students should learn to recognize the strategies that they are using and should receive training as needed in the selection of techniques most appropriate for the instructional environment.

In some cases strategy training can be used to compensate for styles that interfere with the efficient development of language proficiency. Finally, language curricula, materials and instructional approaches should incorporate diversified activities to accommodate the range of perceptual learning styles found in the second language classroom.

In order to more fully understand the combined role of learning styles and strategies in second language acquisition, additional research efforts are needed. Because a consistent picture of the perceptual learning style preferences of adult learners does not exist, it is difficult to establish a context for viewing the learning styles of non-native speakers of English. Therefore, as a key step in follow-up research efforts, a more detailed look at the variables influencing sensory mode dominance needs to be taken in order to create a more accurate profile of the learning styles characteristic of adults in different cultural settings. In addition, the ways in which language learners adapt their styles and strategies over time to meet the challenges of different learning environments might become the basis of a longitudinal study. Important factors to be considered in the adaptation question are the number of years the learner has lived, studied and worked in the host culture and the degree to which he/she has become acculturated. Finally, the learning environment of the second language learner should be studied to assess the relationships that might exist among perceptual learning style preferences, learning strategies, instructional contexts, and teaching methods. Research efforts should be aimed at creating a fully integrated profile of the language learner in terms of the affective, cognitive, and perceptual influences governing second language development.

### References

- Abraham, R. G. (1983). Relationships between use of the strategy of monitoring and cognitive style. Studies in Second Language Acquisition, 6, 17-32.
- Barbe, W. B. & Milone, M. N. (1980). Modality. Instructor, 39 (6), 45-47.
- Barbe, W. B. & Milone, M. N. (1981). What we know about modality strengths. Educational Leadership, 38 (5), 378-380.
- Barbe, W. B., Swassing, R. H., & Milone, M. N. (1979). Teaching through modality strengths: Concepts and practices. Columbus, Ohio: Zaner-Bloser.
- Bennett, C. (1979) Teaching students as they would be taught: The importance of cultural perspective. Educational Leadership, 36 (4), 259-268.
- Bialystok, E. (1979). A theoretical model of second language learning. Language Learning, 28 (1), 69-83.
- Bialystok, E. (1981). The role of conscious strategies in second language proficiency. Modern Language Journal, 65, 24-35.
- Brookfield, S. D. (1986). Understanding and facilitating adult learning. San Francisco: Jossey-Bass Publishers.
- Brown, H. D. (1980). Principles of language learning and teaching. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
- Carbo, M. (1984). Research in learning style and reading: Implications for instruction. Theory into Practice, 23, 72-76.

- Cervenka, E. J. (1978). [Review of Michigan test of English language proficiency]. In O.K. Buros (Ed.), The eighth mental measurement yearbook (pp. 189-190). Highland Park, NJ: The Gryphon Press.
- Chapelle, C. & Roberts, C. (1986). Ambiguity tolerance and field independence as predictors of proficiency in English as a second language, Language Learning, 36 (1), 27-45.
- Cherry, C. E. (1981). The measurement of adult learning styles: Perceptual modality. Dissertation Abstracts International. (University Microfilms No. 82-03-826.
- Cohen, A. (1984). Studying second language learning strategies: How do we get the information? Applied Linguistics, 5 (2), 101-112.
- Davidman, L. (1981). Learning style: the myth, the panacea, the wisdom. Phi Delta Kappan, 62, 641-645.
- Dorian, R. (1985) Learning styles. Togiak, Alaska. (ERIC Document Reproduction Service No. ED 269 201).
- Dorsey, O. R. & Pierson, M. J. (1984). A descriptive study of adult learning styles in a nontraditional education program. Lifelong Learning: An Omnibus of Practice and Research, 7, 8-11.
- Dunn, R. (1984). Learning style: State of the science. Theory into Practice, 23, 10-19.
- Dunn, R. & Dunn, K. (1978). Teaching students through their learning styles: A practical approach. Reston, Virginia: Reston Publishing.
- Dunn, R., Dunn, K., & Price, G. E. (1987). Learning style inventory. Lawrence, KS: Price Systems, Inc.

- Ehrman, M. & Oxford, R. (1988) Ants and grasshoppers, badgers and butterflies: Quantitative and qualitative exploration of adult language learning styles and strategies. Alexandria, VA: Foreign Service Institute, U.S. Department of State.
- Farr, B. J. (1971). Individual differences in learning: Predicting one's more effective learning modality. Unpublished doctoral dissertation, Catholic University.
- Forgus, R. (1966). Perception. New York: McGraw-Hill Book Company.
- Gagne, R. M. (1977). The conditions of learning. New York: Holt, Rinehart & Winston.
- Galbraith, M. & James, W. (1984). Assessment of dominant perceptual learning styles of older adults. Educational Gerontology, 10, 449-457.
- Genessee, F. & Hamayan, E. (1980). Individual differences in second language learning. Applied Psycholinguists, 1, 95-110.
- Gonzales, R. R. & Roll, S. (1985). Relationships between acculturation, cognitive style, and intelligence. Journal of Cross-Cultural Psychology, 16 (2), 190-205.
- Gregorc, A. (1979). Learning/teaching styles: Potent forces behind them. Educational Leadership, 36 (4), 234-236.
- Halverson, C. (1979). Individual and cultural determinants of self-directed learning ability: Straddling an instructional dilemma. In Delmo Della-Dora & Lois Jerry Blanchard (Eds.), Moving toward self-directed learning (pp. 53-65), Alexandria, VA: Association for Supervision and Curriculum Development.

- Hansen, J. & Stansfield, C. (1981). The relationship of field dependent-independent cognitive styles to foreign language achievement. Language Learning, 31 (2), 349-367.
- Hill, J. (1971). Personalized education programs utilizing cognitive style mapping. Bloomfield Hills, MI: Oakland Community College.
- Hosenfeld, C. (1979). A learning-teaching view of second language acquisition. Foreign Language Annals, 12, 51-54.
- James, W. B. & Galbraith, M. W. (1985). Perceptual learning styles: Implications and techniques for the practitioner. Lifelong Learning: An Omnibus of Practice and Research, 8, 20-23.
- Keefe, J. W. (1987). Learning style theory and practice. Reston, VA: National Association of Secondary School Principals.
- Kolb, D. A. (1984) Experiential learning: Experience as the source of learning and development. Englewood Cliffs, NJ: Prentice-Hall.
- Lee, G. E. (1976). The Asian connection. In Claremont Reading Conference 40th Yearbook (ERIC Document Reproduction Service No. ED 137 718).
- Lesser, G.S., Fifer, G., & Clark, D.H. (1965). Mental abilities of children from different social class and cultural groups. Monographs of the Society for Research in Child Development, 30 (4), Serial No. 102.
- Manual, Michigan test of English language proficiency. (1962). Ann Arbor: English Language Institute, University of Michigan.
- Messick, S., & Associates. (1976). Individuality in learning. San Francisco: Jossey-Bass Publishers.

- Miller, C. D., Alway, M., & McKinley, D. L. (1987, September). Effects of learning styles and strategies on academic success. Journal of College Student Personnel, 399-404.
- Naiman, N., Frohlich, M., & Todesco, A. (1975). The good second language learner. TESL Talk, 5 (1), 58-75.
- O'Malley, J. M., Chamot, A. U., Stewner-Manzanares, G., Kupper, L., & Russo, R. (1985a). Learning strategies used by beginning and intermediate ESL students. Language Learning, 35, 21-46.
- O'Malley, J. M., Chamot, A. U., Stewner-Manzanares, G., Russo, R., & Kupper, L. (1985b). Learning strategies applications with students of English as a second language. TESOL Quarterly, 3, 557-584.
- O'Malley, J. M., Chamot, A. U., & Walker, C. (1987). The role of learning strategies in second language acquisition: A model for research in listening comprehension. Alexandria, VA: United States Army Research Institute for the Behavioral and Social Sciences.
- Oxford, R. L. (1986a). Development and psychometric testing of the strategy inventory for language learning (SILL) (Report No. 728). Alexandria, VA: United States Army Research Institute for the Behavioral and Social Sciences.
- Oxford, R. L. (1986b). Second language learning strategies: Current research and implications for practice (Report No. TR 3). Los Angeles, CA: University of California, Center for Language Education and Research (ERIC Document Reproduction Service No. ED 278 273).
- Oxford, R. L. (1987) Strategy inventory for language learning. Alexandria, VA: author.



- Politzer, R. L. & McGroarty, M. (1985). An exploratory study of learning behaviors and their relation to gains in linguistic and communicative competence. TESOL Quarterly, 19 (1), 103-123.
- Price, G. E., Dunn, R., & Sanders, W. (1981). Reading achievement and learning style characteristics. The Clearing House, 54, 224-225.
- Ramirez, A. G. (1986). Language learning strategies used by adolescents studying French in New York schools. Foreign Language Annals, 19, 131-138.
- Ramirez, M. & Castaneda, A. (1974). Cultural democracy, bicognitive development and education. New York: Academic Press.
- Reid, J. (1987). The learning style preferences of ESL students. TESOL Quarterly, 21 (1), 87-111.
- Reinert, H. (1976). One picture is worth a thousand words? Not necessarily. Modern Language Journal, 60, 160-168.
- Reiss, M. (1985). The good language learner: Another look. Canadian Modern Language Review, 4, 511-523.
- Rubin, J. (1981). Study of cognitive processes in second language learning. Applied Linguistics, 11, 117-131.
- Rubin, J. (1975). What the "good language learner" can teach us. TESOL Quarterly, 9 (1), 41-51.
- Schmeck, R. R. (1983). Learning styles of college students. In R. F. G. Dillon & R. R. Schmeck (Eds.), Individual differences in cognition, Vol. 1 (pp. 233-279). New York: Academic Press.
- Stern, H. H. (1975). What can we learn from the good language learner? Canadian Modern Language Review, 31 (4), 304-318.

- Wagner, D. A., Messick, B. M., & Spratt, J. (1986). Studying literacy in Morocco. In B. B. Schieffelin & P. Gilmore (Eds.), The acquisition of literacy: Ethnographic perspectives (pp. 233-260). Norwood, NJ: Ablex.
- Weinstein, C. E. (1985). Assessment & training of student learning strategies. Austin: University of Texas.
- Weinstein, C. E. (1978). Elaboration skills as a learning strategy. In H. F. O'Neil, Jr. (Ed.), Learning Strategies (pp. 31-35). New York: Academic Press.
- Weinstein, C. E., Schulte, A. C., & Cascallar, E. C. (1984). The learning and study strategy inventory (LASSI): Initial design and development. Alexandria, VA: United States Army Research Institute for the Behavioral and Social Sciences.
- Wenden, A. L. (1986). What do second language learners know about their language learning? A second look at retrospective accounts. Applied Linguistics, 7(2), 186-205.
- Witkin, H. A. (1977). Cognitive styles in the educational setting. New York University Education Quarterly, 8, 14-20.

## **APPENDIX A**

### **Strategy Inventory of Language Learning (SILL)**

Strategy Inventory for Language Learning  
Version 6.0 (EFL/ESL) Revised

1. Never or almost never true of me
2. Generally not true of me
3. Somewhat true of me
4. Generally true of me
5. Always or almost always true of me

1. Whenever I can, I look for people I can talk to in English. (B)
2. I listen to the radio or watch movies or TV in English, even if I don't understand everything. (B)
3. I try to think of the grammar rules when I speak English. (J)
4. I notice my mistakes and use that information to help me do better. (J)
5. I try to speak English even when I feel nervous or unsure of how I sound. (G)
6. When I am talking to native speakers, I watch their body language (for example, their hand movements and the expressions on their faces) to help me understand what they are saying. (C)
7. I make relationships between what I already know and new things I learn. (C)
8. I connect the sound of a new word and a picture or image of the word to help me remember the word. (I)
9. I read as much as possible in English. (B)

©R.L. Oxford, 1987

Adapted (EFL/ESL) M. Nyikos, K. Nyikos, R. Oxford, 1988

1. Never or almost never true of me
  2. Generally not true of me
  3. Somewhat true of me
  4. Generally true of me
  5. Always or almost always true of me
10. When I don't understand all the words in a conversation, I try to use what I already know about English, plus my own language, and my knowledge of the topic being discussed to fill in what I don't know. (C)
  11. When I am speaking English and can't remember a particular word, I use gestures, descriptions, or different words to explain what I mean. (C)
  12. To get the main idea of a reading passage, I first skim (read over the whole thing quickly) then I go back and read it more carefully. (A)
  13. I write personal notes and messages in English. (B)
  14. If possible, I look for words in my own language that are similar to the new words in English so I can understand them. (E)
  15. I try to find as many ways as I can to use my English. (B)
  16. I remember a new word by imagining or visualizing a situation in which it usually occurs or might occur. (I)
  17. I draw pictures or cartoons of English words, phrases, or structures to help me remember them. (I)
  18. I can't remember a word or phrase, I ask for help from the person with whom I am speaking. (F)

©R.L. Oxford, 1987

Adapted (EFL/ESL) M. Nyikos, K. Nyikos, R. Oxford, 1988

1. Never or almost never true of me
  2. Generally not true of me
  3. Somewhat true of me
  4. Generally true of me
  5. Always or almost always true of me
19. I find the meaning of a word by breaking it down into parts, such as the root word and prefixes. (J)
  20. I repeat the speaker's sentence to give me more time to think of an answer. (F)
  21. I look for similarities and differences between English and my own language (or other languages I have studied). (C)
  22. If a speaker talks too fast in English, I ask him or her to talk more slowly so I can understand. (F)
  23. To understand unfamiliar words while I'm speaking, I make guesses. (C)
  24. I use familiar words in new combinations to make new sentences. (B)
  25. When I can't think of a word or phrase during a conversation in English, I briefly use my own language and then return to speaking in English to keep the conversation going. (F)
  26. I make unusual or strange connections in order to remember new words. (E)
  27. I check my English writing carefully and go back to correct my written mistakes when I notice them. (H)
  28. I avoid translating what I hear or read in English word-for-word into my own language, or translating from my own language into English. (C)

© R.L. Oxford, 1987

Adapted (EFL/ESL) M. Nyikos, K. Nyikos, R. Oxford, 1988

1. Never or almost never true of me
  2. Generally not true of me
  3. Somewhat true of me
  4. Generally true of me
  5. Always or almost always true of me
29. I say positive things to myself to increase my confidence in my language skills. (H)
30. If I hear a new word in a conversation, I remember it by its sound so that I can look up the meaning later. (D)
31. I actually imagine the spelling of English words in my head. (I)
32. I think in a serious way about the progress I have made in improving my English. (H)
33. I have clear goals for improving my English skills. (H)
34. I look for patterns in English. (J)
35. I develop short sentences in English and then make them longer by adding adjectives, adverbs, and other words. (D)
36. I drill myself on the same word in different forms, for example, different tenses of verbs. (J)
37. I read a story or dialogue several times until I can understand it. (E)
38. I look for exceptions to grammar rules in English. (J)
39. I try to understand the rules of English, and as I learn more, I stop using the rules or change the ones I have made if they are not correct. (J)

‘R.L. Oxford, 1987

Adapted (EFL/ESL) M. Nyikos, K. Nyikos, R. Oxford, 1988

1. Never or almost never true of me
  2. Generally not true of me
  3. Somewhat true of me
  4. Generally true of me
  5. Always or almost always true of me
40. I put the speaker's sentence into my own words to check if I understood what was said. (C)
41. I use reference materials, such as dictionaries, to help me understand English. (A)
42. I make summaries of important information that I hear or read in English. (A)
43. I apply language rules in many situations, even if I might make mistakes sometimes. (J)
44. I remember new words or phrases by remembering their location in the notebook, on the page, on the board, or on a street sign. (E)
45. I study the history and culture of the U.S., England, and/or other English-speaking countries so that I can better understand the language itself. (D)
46. I work as hard as I can to improve my English skills. (J)
47. I use English in teaching my friends as a way of practicing and reviewing. (A)



Your Name: \_\_\_\_\_  
Date Administered: \_\_\_\_\_  
Group or Organization: \_\_\_\_\_

## STRATEGY INVENTORY FOR LANGUAGE LEARNING

### RESPONDENT FEEDBACK FORM

The Strategy Inventory for Language Learning, © R.L. Oxford (1987), is designed to gather information about how you, as a learner of a second or foreign language, go about learning that language. It asks you the frequency with which you use certain behaviors (strategies) for language learning. This feedback form describes your pattern of responses based on ten factors, which were discovered through statistical analysis.

Key: Always or almost always used = 4.5 to 5 ) High frequency range  
Generally used = 3.5 - 4.4 )  
Sometimes used = 2.5 - 3.4 - Medium frequency range  
Generally not used = 1.5 - 2.4 ) Low frequency range  
Never or almost never used = 1.0 - 1.4 )

Note: Results may not be whole numbers due to averaging across items.

---

WHAT THIS FACTOR CONTAINS	FACTOR ABBRE- VIATION	YOUR AVERAGE SCORE ON ITEMS IN THIS FACTOR
---------------------------	-----------------------------	--

---

<u>General learning strategies</u> for reading and study: for example, previewing lessons, using time well, arranging the study environment optimally, being prepared, skimming the reading passage before reading in detail, and checking one's own performance.	GS
---	----

---

<u>Authentic language use</u> , including seeking native speakers with whom to talk, initiating conversations in the new language, and so on.	ALU
---	-----

---

<u>Searching for and communicating meaning</u> , including guessing when complete information is not available, using text markers to help you understand, and finding ways to express meaning, (through gestures, synonyms, etc.) in conversations.	SCM
--	-----

WHAT THIS FACTOR CONTAINS	FACTOR ABBRE- VIATION	YOUR AVERAGE SCORE ON ITEMS IN THIS FACTOR
<u>Independent strategies</u> , which can be used without involving anyone else; for example, reading aloud to yourself, using a tape recorder, singing to yourself, practicing new words mentally, listing related words, and so on.	IS	
<u>Memory strategies (mnemonics)</u> , including listing new words, using rhyming, using flashcards, using accent marks and other phonetic markers to memorize sounds, using repetition, making associations, etc.	M	
<u>Social strategies</u> , which involve asking for examples, working with peers, asking for help, repeating the other person's sentence to get more time, asking for correction, asking the person to slow down, checking notes with classmates, practicing with friends, and switching back to your own language briefly when in conversation with someone else.	SS	
<u>Affective strategies</u> , which relate to dealing with your own feelings and attitudes about language learning: for instance, overcoming fear, frustration, and anxiety by various methods.	AS	
<u>Self-management</u> , including correcting your own written mistakes, encouraging yourself, considering your own progress, planning for future language tasks, identifying goals, and so on.	SM	
<u>Visualization strategies</u> , such as using mental images, linking sounds with visual images, visualizing spelling, and drawing pictures of new words.	VS	
<u>Formal model building</u> , which means constructing your own model of the structure of the language and revising that model as you get more information; involves analyzing your errors, applying and revising grammar rules, analyzing of words into their component parts, and looking for patterns of the new language.	FMB	

## **APPENDIX B**

### **Perceptual Learning Style Preference Questionnaire**

Code No. \_\_\_\_\_

Name: \_\_\_\_\_

-----

PERCEPTUAL LEARNING STYLE PREFERENCE QUESTIONNAIRE

Directions: People learn in many different ways. For example, some people learn by seeing or by listening. Other people learn better by doing things or by using their hands. Some people learn better when they work alone, while others like to learn in groups.

By answering the questions that follow, you can find out how you learn best.

Read each question. Then, think about how you learn something new. Decide if you agree or disagree with each sentence. Mark your answer.

(1) When the teacher tells me the instructions, I understand better.

- \_\_\_\_\_ (a) strongly agree
- \_\_\_\_\_ (b) agree
- \_\_\_\_\_ (c) not sure
- \_\_\_\_\_ (d) disagree
- \_\_\_\_\_ (e) strongly disagree

(2) I prefer to learn by doing something in class.

- \_\_\_\_\_ (a) strongly agree
- \_\_\_\_\_ (b) agree
- \_\_\_\_\_ (c) not sure
- \_\_\_\_\_ (d) disagree
- \_\_\_\_\_ (e) strongly disagree

(3) I get more work done when I work with others.

- \_\_\_\_\_ (a) strongly agree
- \_\_\_\_\_ (b) agree
- \_\_\_\_\_ (c) not sure
- \_\_\_\_\_ (d) disagree
- \_\_\_\_\_ (e) strongly disagree

(4) I learn more when I study with a group.

- \_\_\_\_\_ (a) strongly agree
- \_\_\_\_\_ (b) agree
- \_\_\_\_\_ (c) not sure
- \_\_\_\_\_ (d) disagree
- \_\_\_\_\_ (e) strongly disagree

(5) In class, I learn best when I work with others.

- \_\_\_\_\_ (a) strongly agree
- \_\_\_\_\_ (b) agree
- \_\_\_\_\_ (c) not sure
- \_\_\_\_\_ (d) disagree
- \_\_\_\_\_ (e) strongly disagree

(6) I learn better by reading what the teacher writes on the chalkboard.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(7) When someone tells me how to do something in class, I learn it better.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(8) When I do things in class, I learn better.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(9) I remember things I have heard in class better than things I have read.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(10) When I read instructions, I remember them better.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(11) I learn more when I can make a model of something.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(12) I understand better when I read instructions.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(13) When I study alone, I remember things better.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(14) I learn more when I make something for a class project.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(15) I enjoy learning in class by doing experiments.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(16) I learn better when I make drawings as I study.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(17) I learn better in class when the teacher gives a lecture.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(18) When I work alone, I learn better.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(19) I understand things better in class when I do role playing.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(20) I learn better in class when I listen to someone.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(21) I enjoy working on an assignment with two or three classmates.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(22) When I build something, I remember what I have learned better.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(23) I prefer to study with others.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(24) I learn better by reading than by listening to someone.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(25) I enjoy making something for a class project.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(26) I learn best in class when I can take part in related activities.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(27) In class, I work better when I work alone.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(28) I prefer working on projects by myself.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(29) I learn more by reading textbooks than by listening to lectures.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree

(30) I prefer to work by myself.

- ☐ (a) strongly agree
- ☐ (b) agree
- ☐ (c) not sure
- ☐ (d) disagree
- ☐ (e) strongly disagree



## **APPENDIX C**

### **Michigan Test of English Language Proficiency**

MICHIGAN TEST OF ENGLISH LANGUAGE PROFICIENCY Form F

---

INSTRUCTIONS: Do not begin the test until the examiner has read these instructions with you.

1. This test contains 100 items. These are divided into three parts: Part I is a grammar test; Part II is a vocabulary test; and Part III is a test of reading comprehension. There are examples at the beginning of each part to show you how to answer the problems.
2. Each problem in the test has only one best answer. Make only one mark on your answer sheet for each problem. If you want to change an answer, cross out the old mark several times.
3. Do not make any marks on this test booklet. Write only on your answer sheet.
4. The examiner will not explain any test problem; only the examples in each part may be explained if you do not understand the problems.
5. Try to answer all the problems. Each problem counts the same.
6. You will have 75 minutes to finish the entire test. Do not spend too much time on any one problem or you will not have time to finish the test. Unanswered problems will be counted wrong.
7. Continue working until you have finished the test. Do not stop after each part.
8. Begin the test now.

PART I  
GRAMMAR

This is a test to show how well you can recognize and use English grammatical structures. Each question in this test is part of a conversation. In each conversation a word (or group of words) is left out. Following the conversation are four choices of words which might be used in the incomplete conversation. You are to select the word (or group of words) which would be used by a speaker of English and which will best fit into the conversation.

EXAMPLE A:

"What is that thing?"

"That \_\_\_\_\_ a spider."

- a) to call
- b) for calling
- c) be called
- d) is called

The correct English sentence is: "That is called a spider."

To show that d, is called, is the best answer to this example, a cross has been made next to d for Example A on the answer sheet.

Answer all the questions of Part I in this manner.  
Mark only one answer for each problem.

CONTINUE

1. "Was your friend able to remain in the U.S.?"  
"Yes, the president signed a special order \_\_\_\_\_ him to stay."  
  - a) allowing
  - b) to allowing
  - c) that allowing
  - d) which allowing
2. "Did you read any of Randy's books?"  
"No. I don't like \_\_\_\_\_ Randy writes."  
  - a) such
  - b) that
  - c) which
  - d) what
3. "Will the Andersons move when the child comes?"  
"No, they are going to \_\_\_\_\_ the house."  
  - a) large
  - b) enlarge
  - c) larger
  - d) make large
4. "Is this Mary's answer?"  
"Yes, it's \_\_\_\_\_."  
  - a) she
  - b) she's
  - c) her
  - d) hers
5. "Where will you spend most of your vacation?"  
"In Tokyo; it's the city \_\_\_\_\_ I like best."  
  - a) where
  - b) what
  - c) that
  - d) why
6. "Shall we go to the movies?"  
"Yes. How about \_\_\_\_\_ Jack too?"  
  - a) to ask
  - b) ask
  - c) asking
  - d) asks

7. "Did you arrive first?"  
"No, the student from Los Angeles \_\_\_\_\_ first."  
  - a) there was
  - b) was there
  - c) there were
  - d) were there
8. "Did you see Mary in Rome?"  
"Yes, I saw her just before I \_\_\_\_\_."  
  - a) have left
  - b) having left
  - c) left
  - d) leave
9. "The water level of the lakes is continuing to decrease."  
"It sinks \_\_\_\_\_ every year."  
  - a) in an inch
  - b) the inch
  - c) for an inch
  - d) an inch
10. "Will I have a good time in England?"  
"That depends on how well \_\_\_\_\_."  
  - a) do you speak English
  - b) you speak English
  - c) English you speak
  - d) you do speak English
11. "Have you finished painting your house yet?"  
"I hope to \_\_\_\_\_ tomorrow."  
  - a) doing so
  - b) do
  - c) do so
  - d) having done
12. "Did you go to the game yesterday?"  
"If it \_\_\_\_\_, I would have."  
  - a) hadn't been raining
  - b) hasn't been rained
  - c) hasn't rained
  - d) hasn't been raining
13. "Have you seen Jim recently?"  
"No. I haven't seen him \_\_\_\_\_ a year."  
  - a) for
  - b) since
  - c) by
  - d) through
14. "Was that house expensive?"  
"Yes, it cost \_\_\_\_\_."  
  - a) a fortune
  - b) expensive
  - c) expensively
  - d) highly
15. "Will you finish soon?"  
"Yes, we'll be finished \_\_\_\_\_ Wednesday."  
  - a) by
  - b) at
  - c) when
  - d) as far as
16. "Did you mail the letter?"  
"I would \_\_\_\_\_ if you had told me to."  
  - a) have
  - b) had
  - c) have been
  - d) having been
17. "Where is Stan?"  
"\_\_\_\_\_ so angrily frightened him away."  
  - a) You speak
  - b) You speaking
  - c) Your speaking
  - d) Your speak
18. "Did the professor explain the example again?"  
"Yes, I \_\_\_\_\_ it now."  
  - a) understanding
  - b) understand
  - c) understood
  - d) am understood

19. "Is Mr. Logan familiar with Ireland?"  
"Yes. \_\_\_\_\_ there 40 years, he knows a lot about it."  
a) Having lived  
b) Has been living  
c) Had been living  
d) Has lived
20. "Did the dentist say why your teeth are so bad?"  
"Because I've been eating \_\_\_\_\_ candy bars."  
a) the many  
b) much too  
c) too much  
d) too many
21. "Are you and Gladys ready yet?"  
"I don't know about her, but \_\_\_\_\_ me, I am."  
a) as to  
b) as with  
c) as for  
d) as
22. "Did you expect to win?"  
"No, I was surprised that we \_\_\_\_\_."  
a) have won  
b) won  
c) win  
d) winning
23. "Can the waiter do anything for you?"  
"Yes, \_\_\_\_\_ bring me my bill."  
a) has he  
b) he has  
c) him have  
d) have him
24. "Are you a football enthusiast?"  
"Yes, very much \_\_\_\_\_."  
a) like  
b) as  
c) so  
d) such
25. "Why did you leave the party?"  
"Because my wife made me \_\_\_\_\_."  
a) to be going  
b) going  
c) to go  
d) go
26. "Do you like Dan?"  
"\_\_\_\_\_ my opinion, he's a fool."  
a) To  
b) On  
c) In  
d) Of
27. "Has John left for the show yet?"  
"It doesn't seem very \_\_\_\_\_ that he has."  
a) like  
b) alike  
c) likely  
d) likeable
28. "How's John doing in school?"  
"He's a good student, \_\_\_\_\_ his best subject."  
a) as English  
b) English as  
c) English being  
d) being English
29. "May I come to the play Saturday night?"  
"Certainly. \_\_\_\_\_ wants to may come."  
a) One  
b) Anyone  
c) Everyone  
d) Whoever
30. "John arrived at 2 a.m."  
"Why \_\_\_\_\_ he got here then?"  
a) was that  
b) was it that  
c) that was  
d) it was that

31. "Do all the questions count the same?"  
 "Yes, each \_\_\_\_\_ one point."  
 a) are worth  
 b) is worth  
 c) worths  
 d) worthy
32. "Isn't this the key you want?"  
 "Yes, \_\_\_\_\_."  
 a) it's the one  
 b) it the one  
 c) it's key  
 d) it's
33. "What is all the noise about?"  
 "There \_\_\_\_\_ a parade and fireworks."  
 a) are  
 b) is  
 c) have  
 d) has
34. "Why does the government give scholarships?"  
 "Many people would otherwise \_\_\_\_\_ the opportunity to go to school."  
 a) be lacking of  
 b) have lacking of  
 c) lack  
 d) lack of
35. "I have an old chair I never use anymore."  
 "Would you consider \_\_\_\_\_ it?"  
 a) about selling  
 b) to be selling  
 c) to sell  
 d) selling
36. "Was the theatre crowded?"  
 "Yes, there were a lot \_\_\_\_\_ people there than I expected."  
 a) more  
 b) more of  
 c) more than  
 d) of
37. "Why did the judge criticize the lawyer?"  
 "Because he didn't keep his remarks to the topic \_\_\_\_\_ discussion."  
 a) on  
 b) with  
 c) at  
 d) under
38. "Should I see a doctor?"  
 "Yes, I suggest you \_\_\_\_\_ to see Dr. Brown."  
 a) go  
 b) going  
 c) be going  
 d) to go
39. "I understand Bill won a lot of money in the contest."  
 "Yes, his wife bought a new car out of his \_\_\_\_\_."  
 a) win  
 b) wins  
 c) winning  
 d) winnings
40. "Do you owe Pete money?"  
 "Yes, I am in debt \_\_\_\_\_ him."  
 a) with  
 b) to  
 c) from  
 d) of

CONTINUE TO PART II

PART II  
VOCABULARY

There are two types of vocabulary items in this test. In the first type you are given a sentence followed by four words or phrases. You are to find the word or phrase that is closest in meaning to the underlined word (or words) in the sentence and that could be used in the sentence without changing its meaning greatly.

**EXAMPLE B:** It's too windy to go for a stroll.

- a) swim
- b) sail
- c) drive
- d) walk

The word 'walk' means about the same thing as 'stroll' in this sentence. The sentence "It's too windy to go for a walk," means the same thing as "It's too windy to go for a stroll." To show that d. walk is the correct answer, a cross has been made in the space next to d for Example B on the answer sheet.

In the other type of item you are given a sentence with one word omitted and a list of four words. You are to find the word that would best complete the sentence.

**EXAMPLE C:** Because of the storm and rough waves, it would be foolish to go out sailing today in a small \_\_\_\_\_.

- a) automobile
- b) house
- c) boat
- d) beast

The word 'boat' fits best in the sentence so that it reads, "Because of the storm and rough waves, it would be foolish to go out sailing today in a small boat." To show that c. boat is the correct answer, a cross has been made in the space next to c for Example C on the answer sheet.

Answer all of the questions of Part II in this manner.  
Mark only one answer for each problem.

CONTINUE

41. I could hardly hear John because his voice was almost \_\_\_\_\_.

- a) audacious
- b) inaudible
- c) subordinate
- d) dense

42. No one else must hear of this conversation. It must remain \_\_\_\_\_.

- a) conventional
- b) consummate
- c) confidential
- d) consolidated

43. Louis looked solemnly at the people around him.

- a) slowly
- b) weakly
- c) happily
- d) seriously

44. The machine started abruptly.

- a) accidentally
- b) noisily
- c) quietly
- d) suddenly

45. John never studies; it isn't surprising that his work is \_\_\_\_\_ to Jim's.
- a) alternate
  - b) external
  - c) inferior
  - d) embarrassing
46. He didn't want to be taken into the army, so he \_\_\_\_\_ in the navy instead.
- a) precipitated
  - b) pervaded
  - c) inserted
  - d) enlisted
47. I found Bob deep in meditation.
- a) study
  - b) prayer
  - c) trouble
  - d) thought
48. Jack is taking Linda to the movies, and I am \_\_\_\_\_ Laura.
- a) provoking
  - b) escorting
  - c) withdrawing
  - d) overwhelming
49. He belongs to a little-known \_\_\_\_\_ of Christianity.
- a) ordinance
  - b) precinct
  - c) sect
  - d) farce
50. The roads are treacherous now.
- a) empty
  - b) dangerous
  - c) busy
  - d) safe
51. We went outside to be \_\_\_\_\_ by the fresh air.
- a) revised
  - b) survived
  - c) refined
  - d) revived
52. John was indignant.
- a) successful
  - b) tired
  - c) poor
  - d) angry
53. Many people starved; there was no food during the \_\_\_\_\_.
- a) falter
  - b) famine
  - c) farce
  - d) fathom
54. Ralph has the first part done and is now \_\_\_\_\_ good progress on the second half.
- a) making
  - b) having
  - c) getting
  - d) doing
55. The little boy grabbed the bottle and ran away.
- a) threw
  - b) broke
  - c) took
  - d) dropped
56. I would like a nice plump chicken, please.
- a) fat
  - b) tender
  - c) baked
  - d) cleaned
57. He devoured the fish.
- a) served
  - b) ate
  - c) caught
  - d) skinned
58. Nancy is very careful about spending money and she wants her husband to be \_\_\_\_\_ too.
- a) nasty
  - b) thrifty
  - c) slippery
  - d) provincial



59. They hoisted the old flag.

- a) guarded
- b) raised
- c) lowered
- d) burned

60. He was outraged by her actions.

- a) angered
- b) shamed
- c) comforted
- d) surprised

61. All right children, \_\_\_\_\_ along and play outside now.

- a) be
- b) run
- c) take
- d) walk

62. He dispatched the truck.

- a) sent
- b) loaded
- c) sold
- d) repaired

63. She is a woman of great integrity.

- a) practicality
- b) determination
- c) charm
- d) honesty

64. He was stunned by the news.

- a) comforted
- b) excited
- c) surprised
- d) disappointed

65. Because of the need to get the information quickly, a messenger was \_\_\_\_\_.

- a) resented
- b) prolonged
- c) dismissed
- d) dispatched

66. The appearance of the house will be enhanced by the addition of the new room.

- a) changed
- b) unchanged
- c) improved
- d) balanced

67. In order to cross that bridge you must pay a ten-cent \_\_\_\_\_.

- a) toll
- b) quest
- c) discount
- d) excursion

68. If you look at the map, you will see that between the island and the mainland there's a narrow \_\_\_\_\_.

- a) strife
- b) stripe
- c) strait
- d) streak

69. Over the mountains is a quaint old town called Clymer.

- a) royal
- b) friendly
- c) famous
- d) curious

70. Their enmity was common knowledge.

- a) interest
- b) doubt
- c) fear
- d) hatred

71. I don't want to be exploited.

- a) used
- b) surprised
- c) removed
- d) troubled

72. He eventually found the answer.

- a) never
- b) almost
- c) finally
- d) suddenly

73. It was bad, but the only one to whimper was Sam McGee.
- a) cry
  - b) fight
  - c) leave
  - d) laugh
74. Many of the cattle starved that winter because they couldn't find \_\_\_\_\_ under the snow.
- a) grit
  - b) gauze
  - c) forage
  - d) livery
75. We were very discouraged by his demeanor.
- a) conduct
  - b) failure
  - c) answer
  - d) anger
76. I forgive him; I'm not the sort of person to hold \_\_\_\_\_.
- a) an outrage
  - b) a grudge
  - c) an anguish
  - d) an injustice
77. His blunder was a surprise to everyone.
- a) mistake
  - b) statement
  - c) protest
  - d) attack
78. The scanty crowd moved towards the airplane.
- a) large
  - b) small
  - c) angry
  - d) cheering
79. They couldn't sail until the storm had \_\_\_\_\_ a little.
- a) subsided
  - b) augmented
  - c) evaporated
  - d) halted
80. When they searched his house, they found a blunt knife.
- a) broken
  - b) dull
  - c) sharp
  - d) bloody

CONTINUE TO PART III

PART III

READING COMPREHENSION

This is a test to show how well you read. There are four reading passages each followed by five questions about the passage. You should read each passage carefully and then try to answer the questions following that passage. If you do not know the answer at first, you may read the passage again, but do not spend too much time on one passage or you will not have enough time to finish.

EXAMPLE:

While I was getting ready to go to town one morning last week, my wife handed me a little piece of red cloth and asked if I would have time during the day to buy her two yards of cloth like that. I told her I would be glad to do it. And putting the piece of cloth into my pocket, I took the train for town.

D. The person telling the story is . . .

- a) a married lady.
- b) an unmarried lady.
- c) a married man.
- d) an unmarried man.

You know that the person telling this story is a married man because he says, "... my wife handed me ..." Because c, a married man, is the correct answer, a cross has been made in the space next to c for Example D on the answer sheet.

E. The author was given a piece of red cloth . . .

- a) in the morning.
- b) at noon.
- c) in the afternoon.
- d) in the evening.

The passage says, "... one morning last week, my wife handed me a little piece of red cloth ..." To show that a, in the morning, is the correct answer, a cross has been made in the space next to a for Example E on the answer sheet.

Answer all questions of Part III in this manner.  
Mark only one answer for each problem.

CONTINUE

St. Louis is a city set apart in the Midwest; in the region, yet not entirely of it; French in origin; German in settlement and development; swaddled at birth in furs and skins brought in by the forerunners of the pioneers, the coureurs des bois, the hunters and trappers; owning slaves and still largely southern in outlook; drawn to the North and East by the rail traffic; made into an industrial, financial, and commercial metropolis and a hub of communications; but still more stable, ordered, and settled in its way of life than any other Midwest city. You cannot think of St. Louis without thinking of its great river front and of the Mississippi, of Mark Twain, of the north-south and east-west river traffic of which the city was the junction, and of its relation to New Orleans, Memphis, Cincinnati, Louisville, and Pittsburgh.

81. The first permanent settlers of St. Louis were . . .

- a) slave owners.
- b) French hunters.
- c) Germans.
- d) Eastern industrialists.

82. The hunters and trappers . . .

- a) were stable, ordered, and settled in their way of life.
- b) dressed their children from birth in furs and skins.
- c) were forerunners of the pioneers.
- d) owned slaves and are still largely southern in outlook

83. St. Louis was drawn to the East because of . . .

- a) slavery.
- b) its stability.
- c) the coureurs des bois.
- d) the railway system.

84. A notable feature of St. Louis is . . .

- a) its riverfront.
- b) its seaport.
- c) its pioneer spirit.
- d) the way the people dress there.

85. The spirit of St. Louis is most like that of . . .

- a) the East.
- b) the South.
- c) the North.
- d) the Midwest.

In the last half century concepts of conservation have grown more sophisticated, less parsimonious. Natural conditions are no longer automatically presumed to be best. It has been demonstrated, for example, that controlled burning protects Southern pine woods better than absolute prohibition of fire, and that the shooting of doe may be necessary to prevent the starvation and extinction of deer. Resource managers have abandoned the goal of preservation, with its romantic concomitants, in favor of more flexible present use and development; and they distinguish among resources that are inexhaustible, those that are renewable, and those that are neither. But the public at large continues to hold to the older conservation mystique, according to which nature is always right and man is usually wrong.

86. The author states that controlled burning . . .
- a) is primarily a demonstration device.
  - b) is a protective measure.
  - c) prevents deer from starving.
  - d) is destructive.
87. The goal of preservation was abandoned after changes were dictated by . . .
- a) powerful private groups.
  - b) a less simple minded view of conservation.
  - c) a reaction against romanticism.
  - d) growing public concern about conservation.
88. The author says that modern conservationists are mainly concerned with . . .
- a) use and development.
  - b) prohibition.
  - c) romantic ideals.
  - d) demonstration.
89. The author cites the case of deer to show that . . .
- a) the use of resources can actually preserve them.
  - b) deer is a renewable resource.
  - c) deer are becoming extinct.
  - d) there are too many deer now.
90. The author says that in matters of conservation the public is . . .
- a) demanding rapid changes.
  - b) fifty years behind the times.
  - c) not interested.
  - d) more concerned than ever.

With the discovery of Traherne in 1909, the world of letters at once welcomed him into its fellowship, and acknowledged his kinship with Vaughan and Herbert and other mystical writers of the Church of England in the 17th century who came under the Neoplatonic influence of the day. Scholars have busied themselves for two decades to find out the facts of his life, but the modesty and humility of Traherne will not abide their questioning. The few details given by Anthony à Wood constitute the bulk of our knowledge of the man. He was the son of a shoemaker of Hereford, and came of an ancient Welsh family which had been reduced almost to poverty. Traherne's poems contain many autobiographical hints, but they have to do chiefly with the mind and soul of the poet rather than with his physical progress in the world. He was able to go to Oxford, and took his degree at Brasenose College in 1656. He entered the church, and retired to a country parish near Hereford where he lived a peaceful and meditative life. He was later called to London to become chaplain to Sir Orlando Bridgeman, Lord Keeper of the Seals, and returned with him afterwards to Hereford. Traherne survived his patron but lived on at his house, and died there at the age of 38. At his death he had some 5 pounds in money and a few clothes to bequeath to his friends.

91. From Traherne's poetry, we can get many hints about his...

- a) family and poverty.
- b) spiritual experiences.
- c) relationship to Bridgeman.
- d) relationship with Anthony à Wood.

92. In 1909, the literary world discovered...

- a) Traherne's poetical works.
- b) a biography of Traherne.
- c) the mysticism in 17th century poetry.
- d) Vaughan and Herbert's influence on the writing of Traherne.

93. Vaughan and Herbert differ from Traherne in that they were...

- a) not poor.
- b) not priests.
- c) known earlier.
- d) earlier writers.

94. Immediately after he left Oxford, Traherne...

- a) lived near his childhood home.
- b) retired from writing.
- c) became Bridgeman's chaplain.
- d) lost his money.

95. How did Bridgeman treat Traherne?

- a) He introduced him to London society.
- b) He enabled Traherne to go to Oxford.
- c) He was kind to Traherne but paid him little.
- d) He encouraged Traherne to write.

Counterpoint, a phrase now used exclusively in music, originally stood for Number Three of the general Principles of Gamesmanship: "PLAY AGAINST YOUR OPPONENT'S TEMPO." This is one of the oldest gambits and is almost entirely used in the form "My Slow to Your Fast." E.g. at golf especially, against a player who makes a great deal of "Wanting to get on with the game," the technique is (1) to agree (Jeffreys always adds here "as long as we don't hurry on the shot"); (2) to hold things up by fifteen to twenty disguised pauses. Peg-top tees for golf were introduced by Samuel in '33 for this use. The technique is to tee the ball, frame up for the shot, and then at the last moment stop, pretend to push the peg a little further in or pull it a little further out, and then start all over again. At the next hole vary this with Samuel's "Golden Perfecto" peg tee, made in such a way that the ball, after sitting still in the cup for two to three seconds, rolls off.

96. The third general Principle of Gamesmanship is designed to . . .

- a) gain psychological advantage over one's opponent.
- b) prevent players from breaking rules.
- c) encourage losing graciously.
- d) encourage fair play.

97. Peg-top tees are useful in . . .

- a) getting the last shot.
- b) disguising pauses.
- c) Jeffrey's gambit.
- d) frame ups.

98. For maximum efficiency in the use of Counterpoint, the Gamesman should alternate peg-top tees with . . .

- a) "Golden Perfecto" peg tees.
- b) Samuel's 33 techniques.
- c) a last moment stop.
- d) a ball that rolls off the tee.

99. In Gamesmanship, the term "Counterpoint" means that the Gamesman . . .

- a) disagrees with his opponent's points.
- b) uses a tempo different from that of his opponent.
- c) allows his opponent to vary his tempo.
- d) varies his own tempo.

100. Agreeing to get on with the game and then holding things up . . .

- a) was introduced in '33 by Samuel.
- b) makes hurrying on the shot optional.
- c) has no practical value in Gamesmanship.
- d) is an example of playing against your opponent's tempo.

END OF TEST

Check your answers.

Be sure that your name is on your answer sheet.

## **APPENDIX D**

### **Questionnaire of Student Background Characteristics**



Code No. \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

-----  
BACKGROUND INFORMATION

(1) Native Country: \_\_\_\_\_

(2) Age: \_\_\_\_\_ (3) Sex:     M     F

(4) How long have you lived in the United States? \_\_\_\_\_

(5) Have you worked since you came to the United States?     Yes     No

(6) If you said yes, how long have you worked? \_\_\_\_\_

(7) How often do you speak English outside of class?

Check one:     Often     Sometimes     Never

(8) How many years of school did you finish in your native country?  
Circle the number of years:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

(9) Did you have any special job training in your native country?

\_\_\_\_\_ Yes     \_\_\_\_\_ No

(10) If you said yes, what type of training did you have?  
\_\_\_\_\_

(11) Did you go to college in your country?     Yes     No

(12) If you said yes, what did you study?  
\_\_\_\_\_

(13) Did you work in your native country?     Yes     No

(14) If you said yes, what job did you have?  
\_\_\_\_\_

(15) What do you plan to study in the future?  
\_\_\_\_\_

(16) What job would you like to have in the future?  
\_\_\_\_\_

## **APPENDIX E**

### **Subject Consent Form**

## SUBJECT CONSENT FORM

The tests that you will be taking are part of a study on how adults learn a second language. You will be given three tests. One will measure your level of English and two will give information about the ways that you like to study English. The study is being conducted by a graduate student at Drake University in Des Moines, Iowa.

It is not necessary to answer any questions that you do not want to. Your answers will be kept confidential.

I HAVE READ THE ABOVE STATEMENT AND AGREE TO TAKE PART IN THE STUDY.

\_\_\_\_\_  
Signature

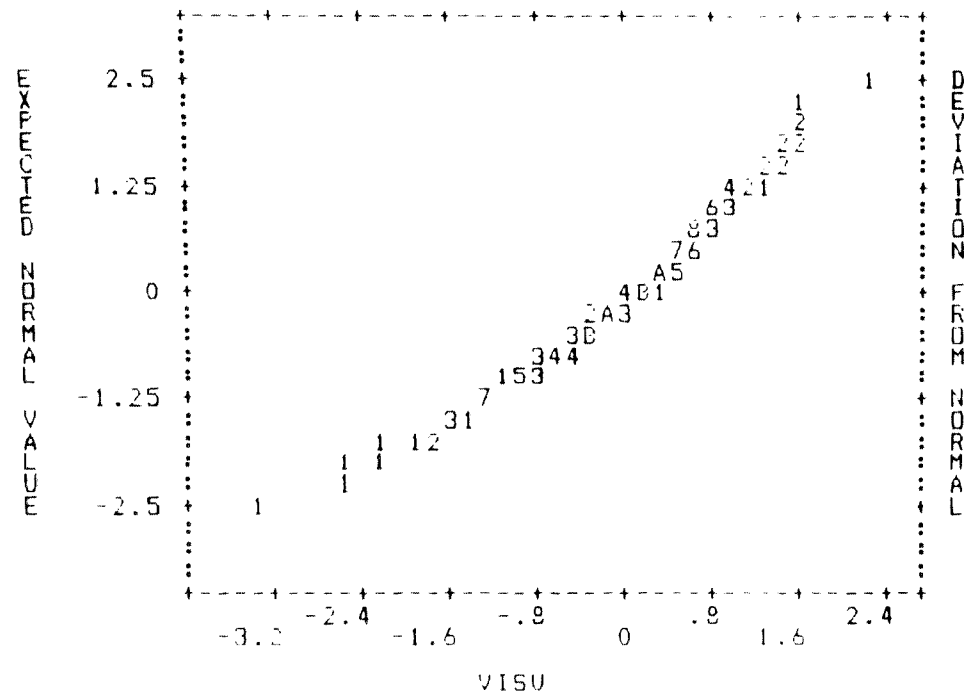
\_\_\_\_\_  
Date

## **APPENDIX F**

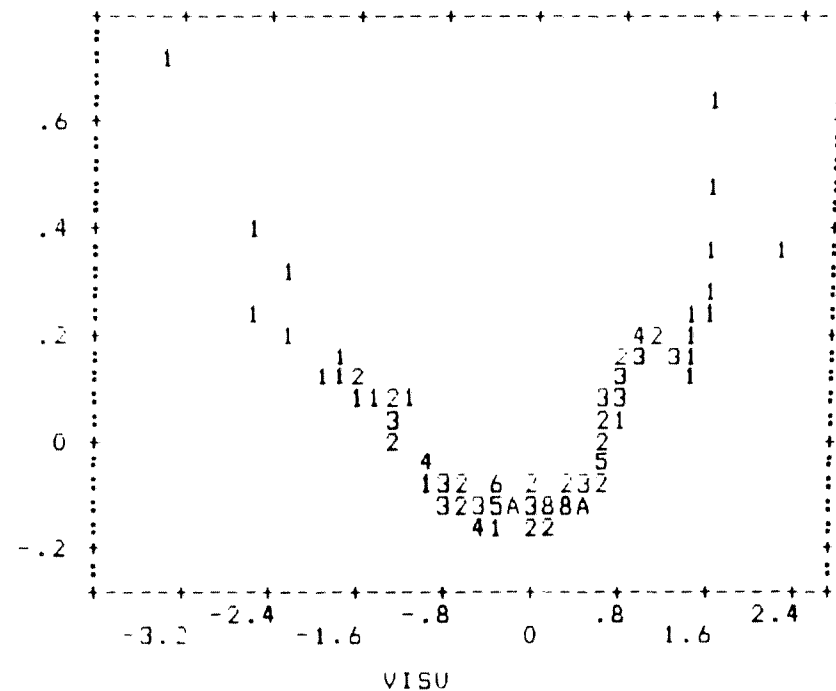
### **Normal Probability Plots for Multivariate Analysis of Variance**

\*\*\*\*\* ANALYSIS OF VARIANCE -- DESIGN 1\*\*\*\*\*

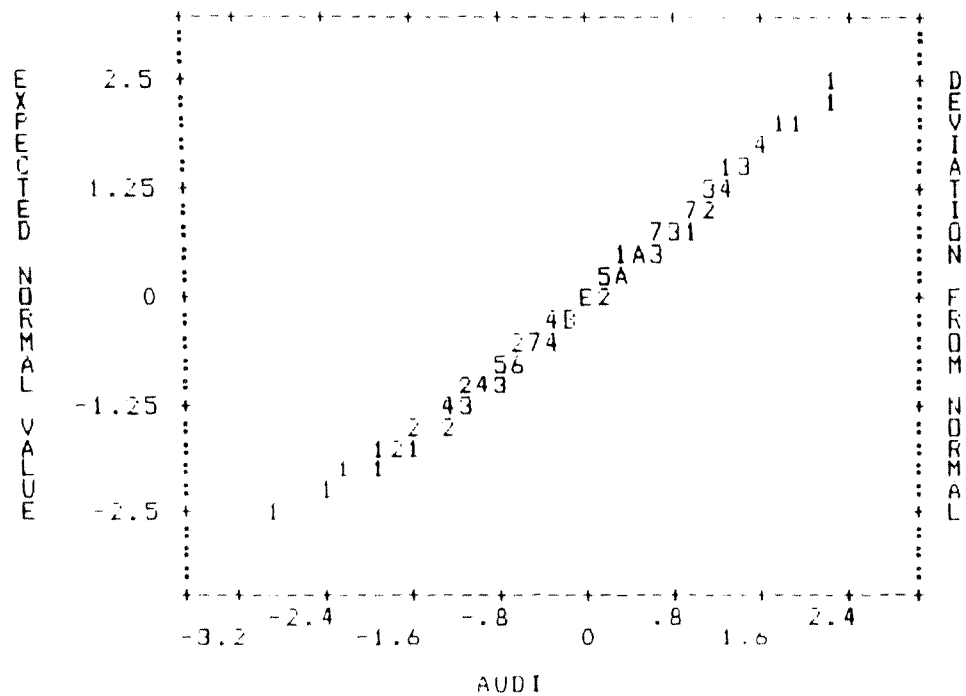
Plots of Observed, Predicted, and Residual Case Values  
Normal Plot



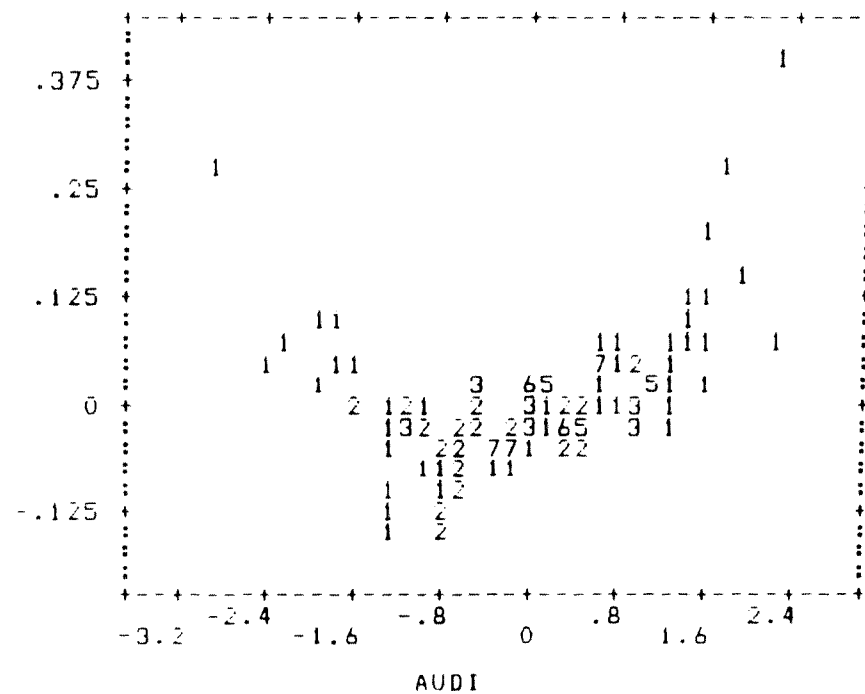
Detrended Normal Plot



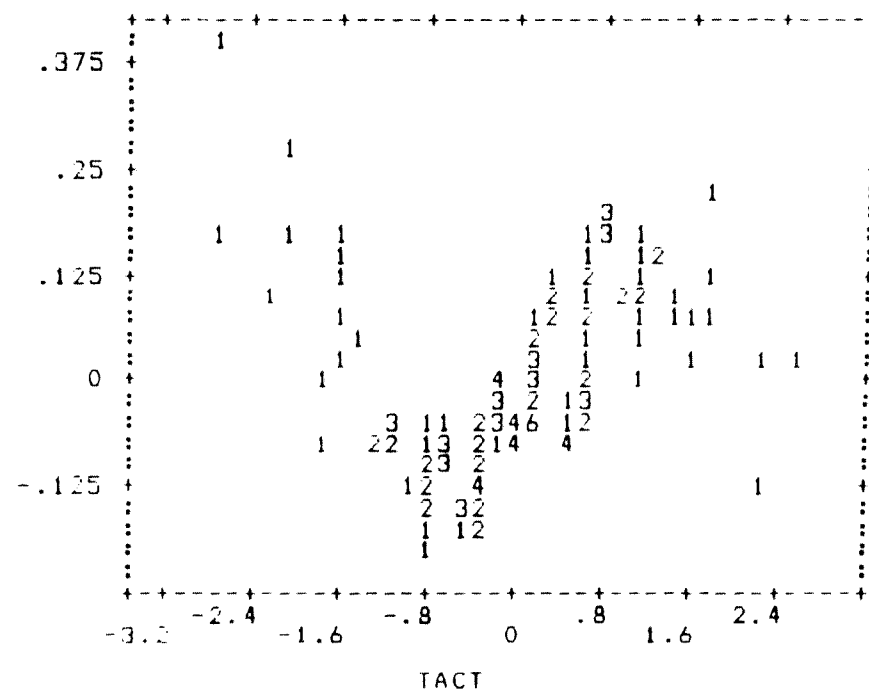
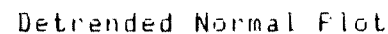
\*\*\*\*\* ANALYSIS OF VARIANCE -- DESIGN 1 \*\*\*\*\*  
 Plots of Observed, Predicted, and Residual Case Values  
 Normal Plot



\*\*\*\*\* ANALYSIS OF VARIANCE -- DESIGN 1 \*\*\*\*\*  
 Detrended Normal Plot

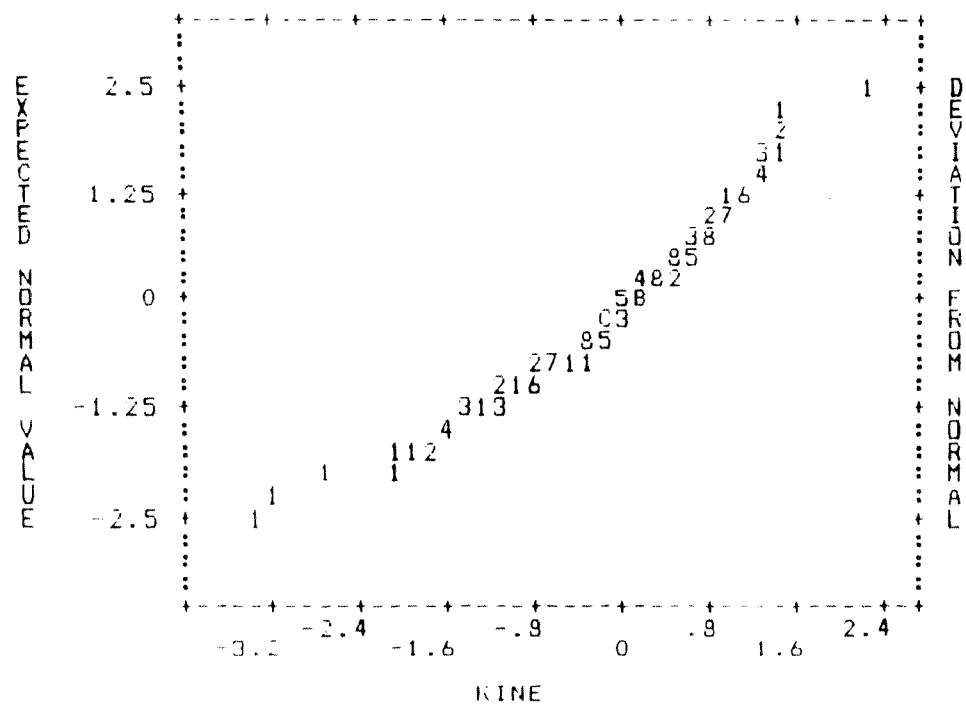


Plots of Observed, Predicted, and Residual Case Values (Cont.)

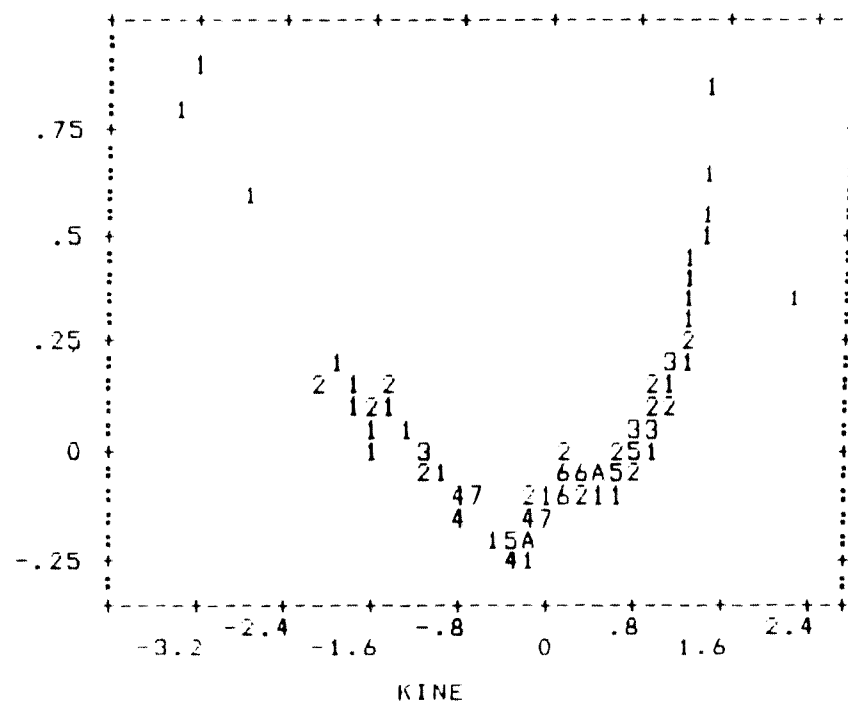


\*\*\*\*\* ANALYSIS OF VARIANCE -- DESIGN 1\*\*\*\*\*

Plots of Observed, Predicted, and Residual Case Values (Cont.)  
Normal Plot



Detrended Normal Plot

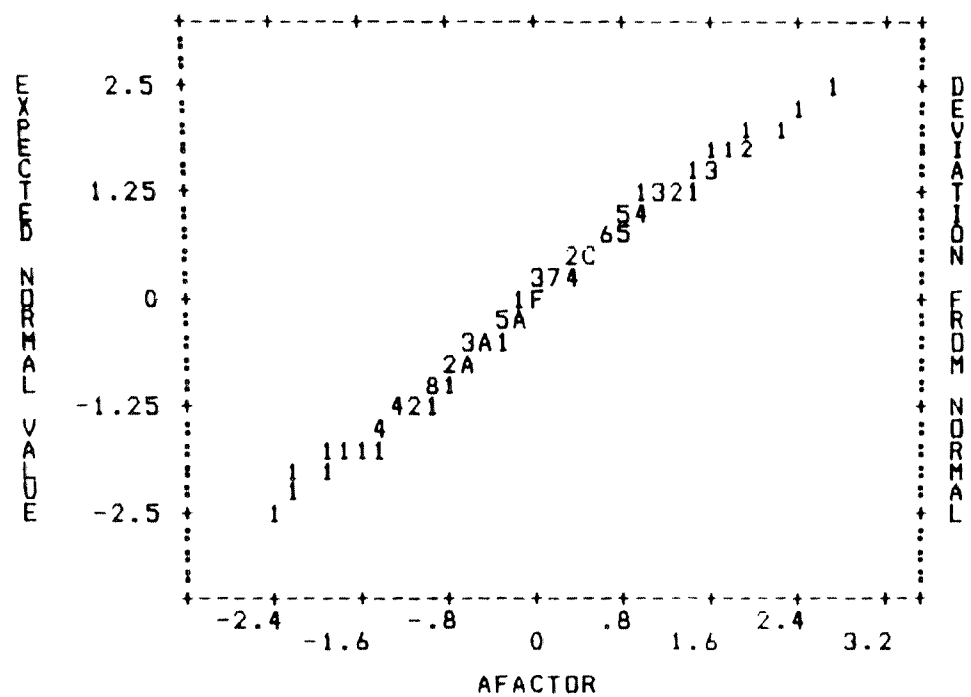




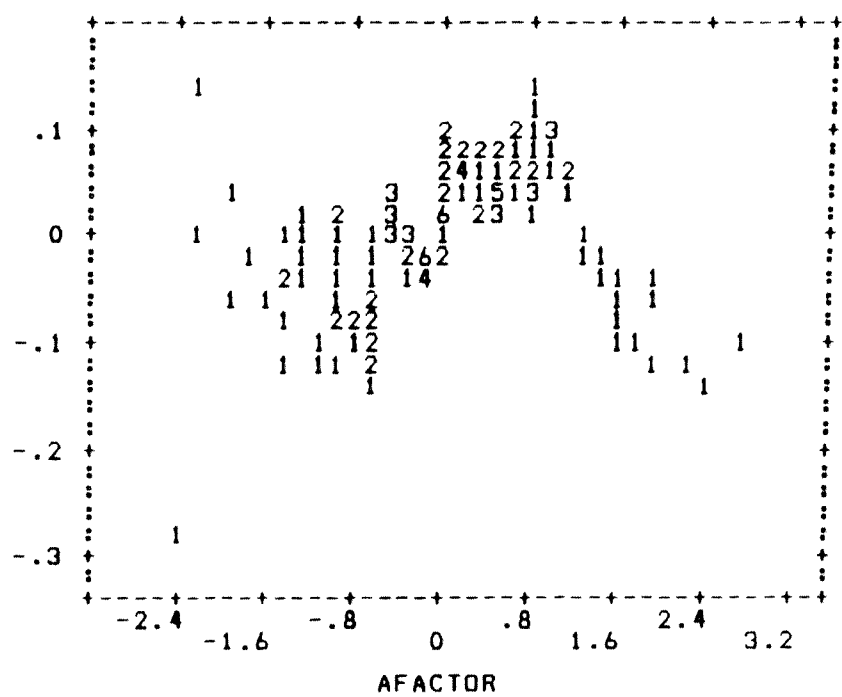
\*\*\*\*\* ANALYSIS OF VARIANCE -- DESIGN 1\*\*\*\*\*

Plots of Observed, Predicted, and Residual Case Values (Cont.)

Normal Plot

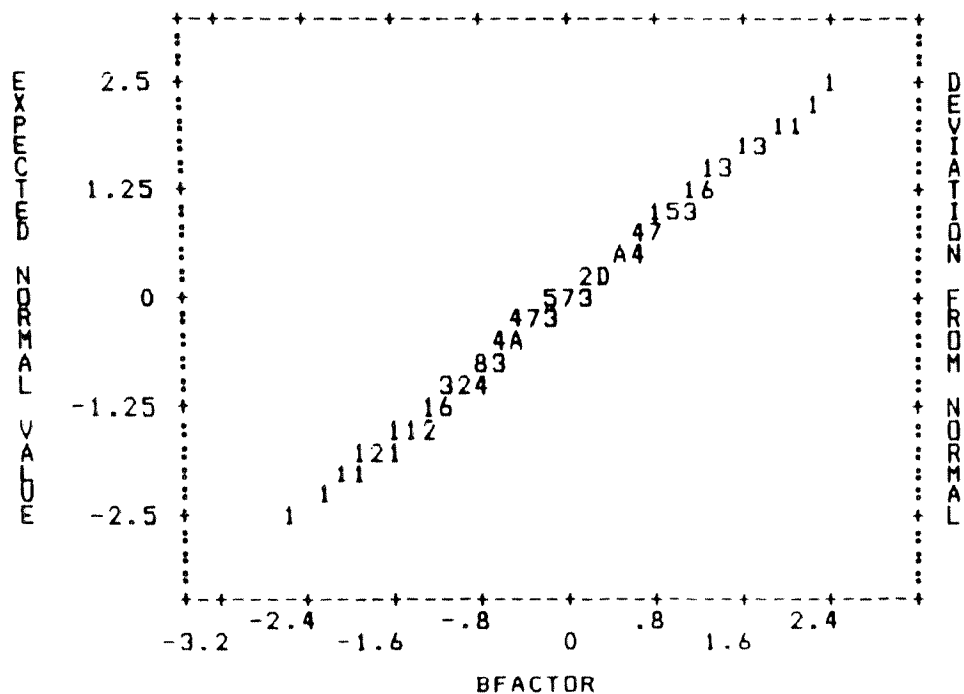


Detrended Normal Plot

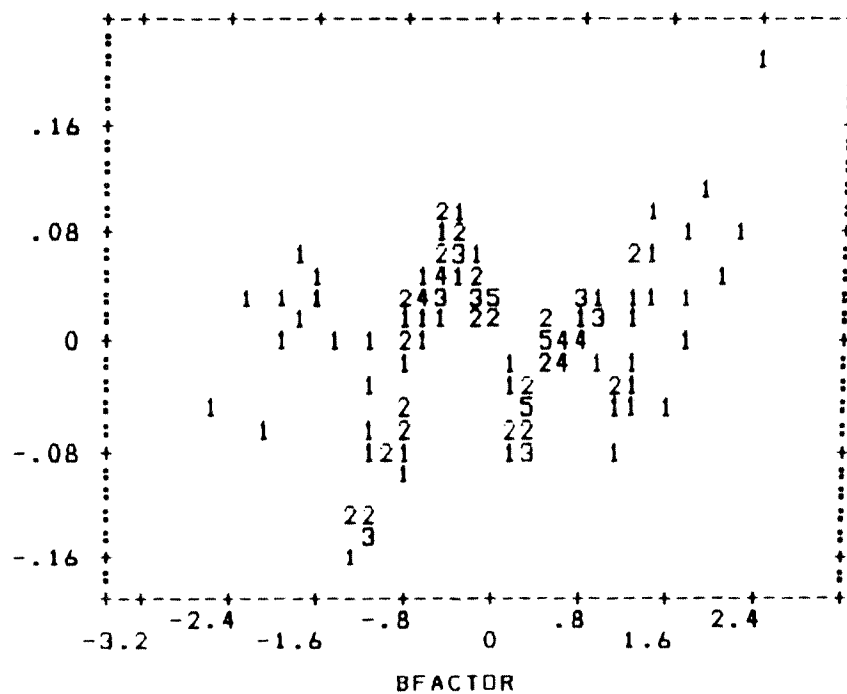


## Plots of Observed, Predicted, and Residual Case Values (Cont.)

### Normal Plot



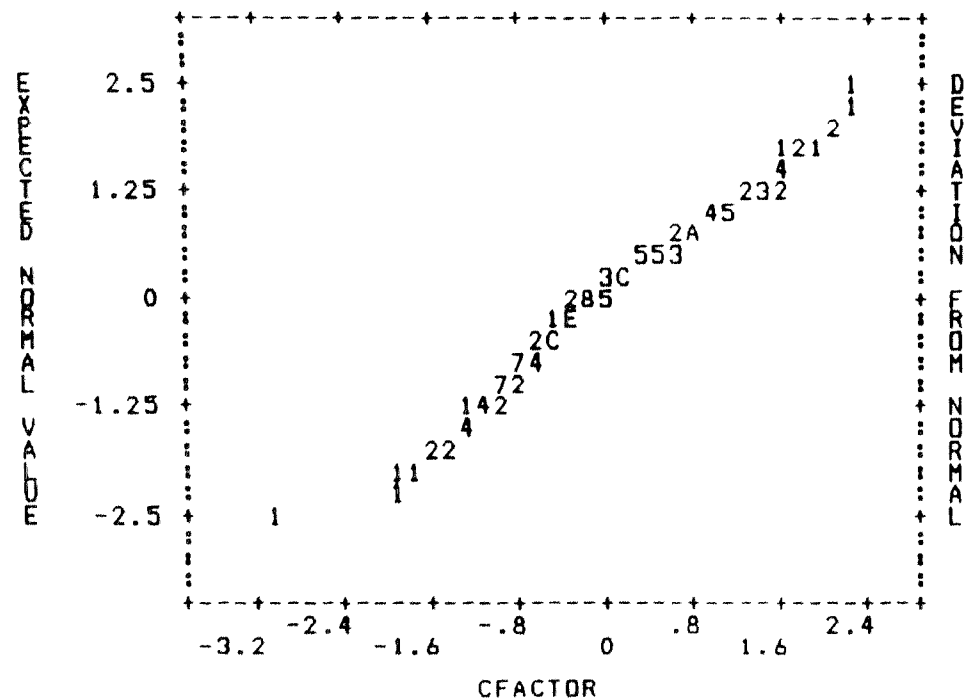
Detrended Normal Plot



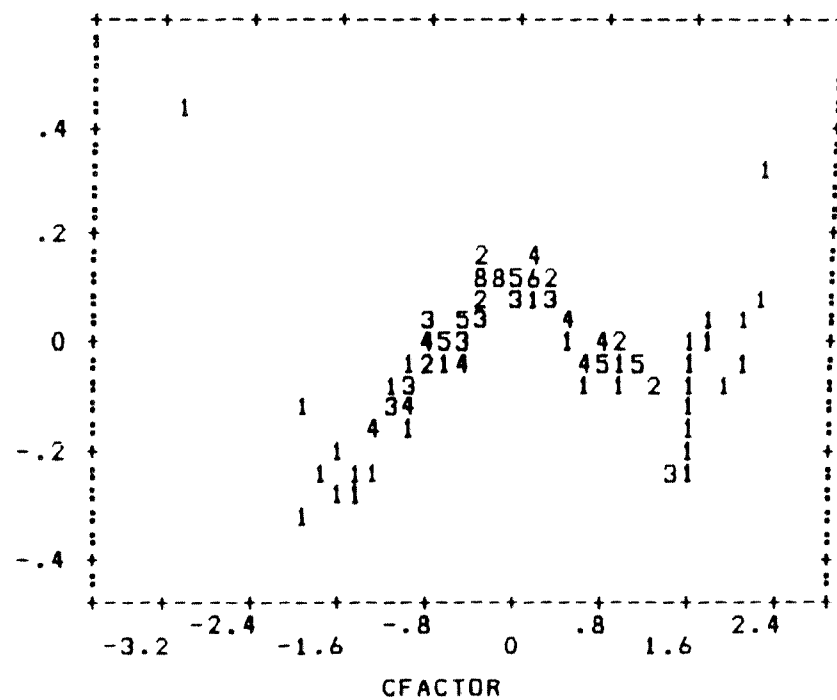
\*\*\*\*\* ANALYSIS OF VARIANCE -- DESIGN 1\*\*\*\*\*

Plots of Observed, Predicted, and Residual Case Values (Cont.)

Normal Plot



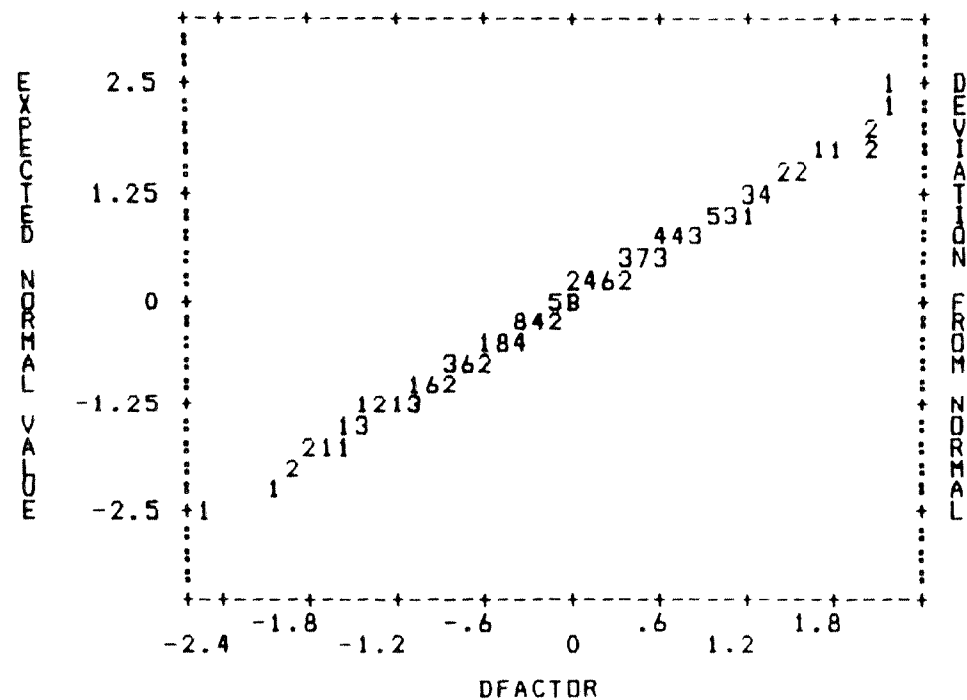
Detrended Normal Plot



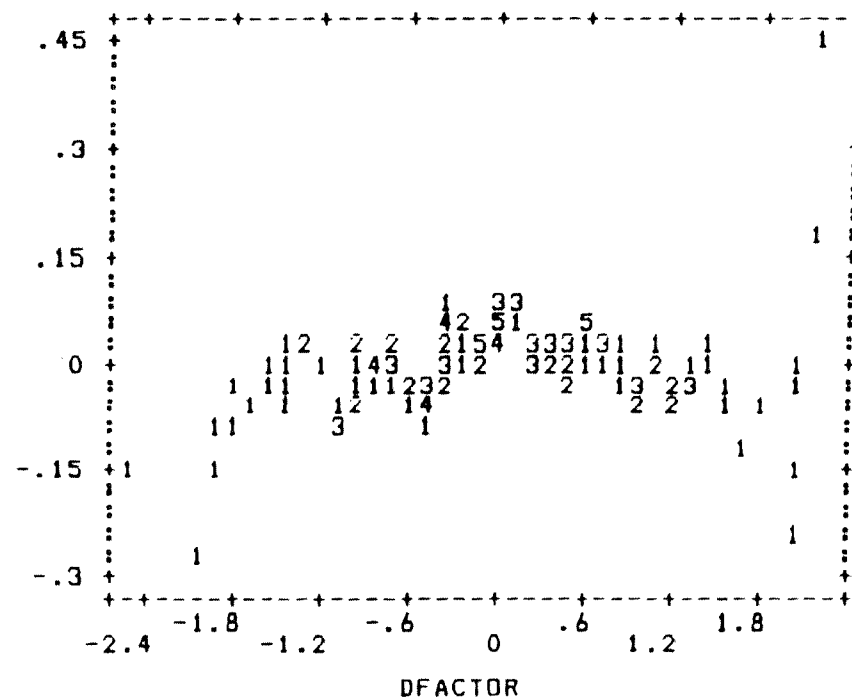
\*\*\*\*\* ANALYSIS OF VARIANCE -- DESIGN 1\*\*\*\*\*

Plots of Observed, Predicted, and Residual Case Values (Cont.)

Normal Plot



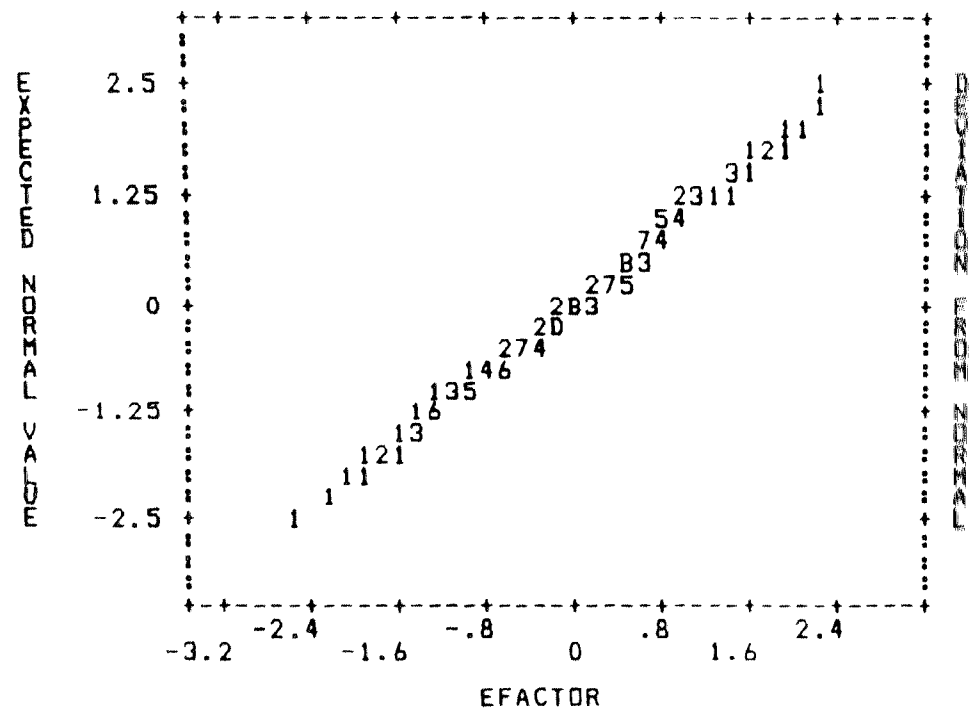
Detrended Normal Plot



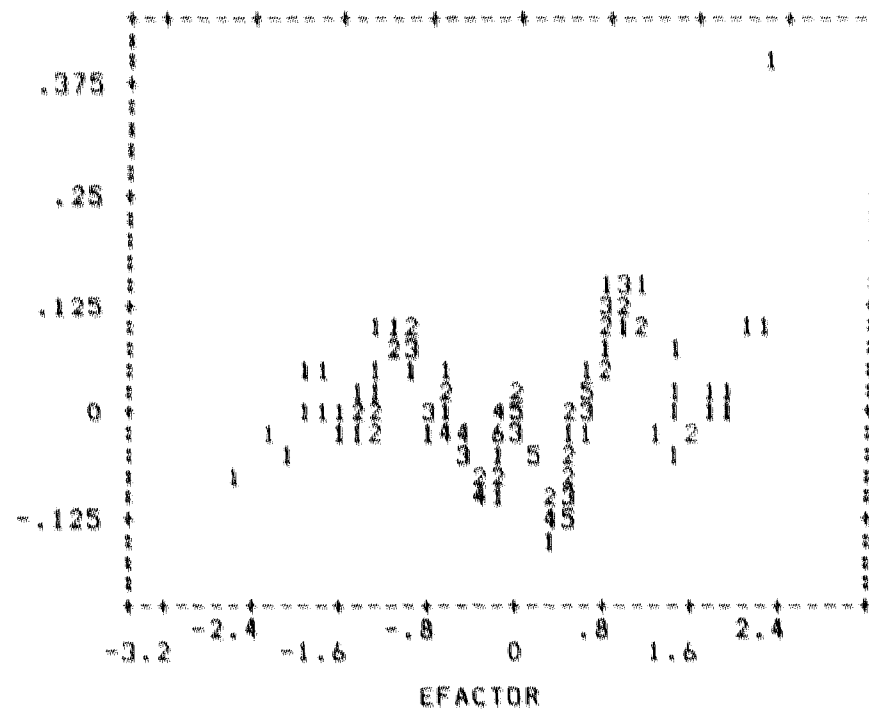
\*\*\*\*\* ANALYSIS OF VARIANCE -- DESIGN 1\*\*\*\*\*

Plots of Observed, Predicted, and Residual Case Values (Cont.)

Normal Plot

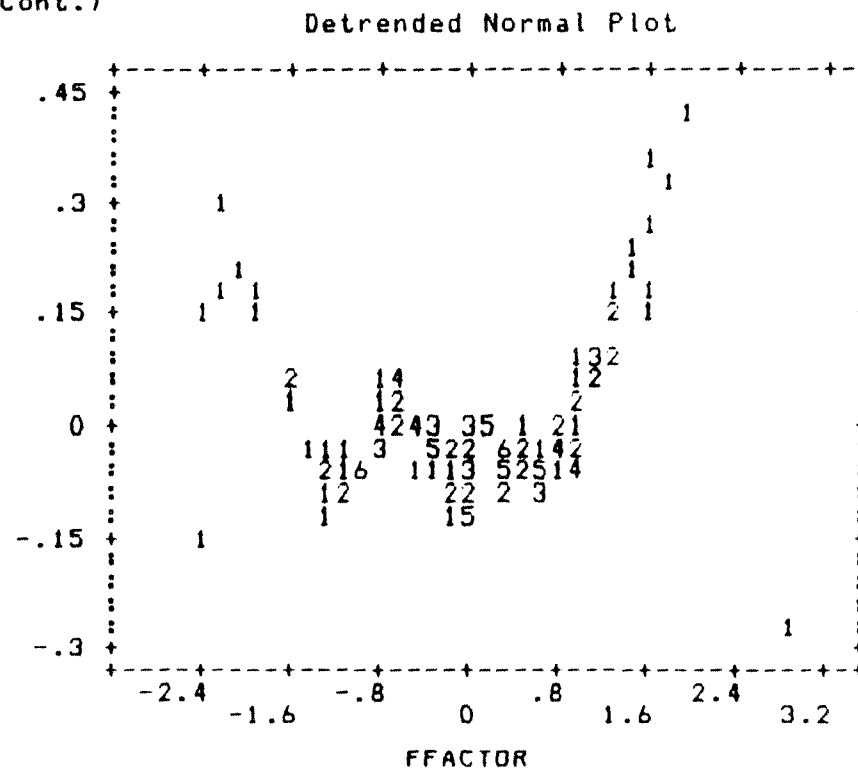
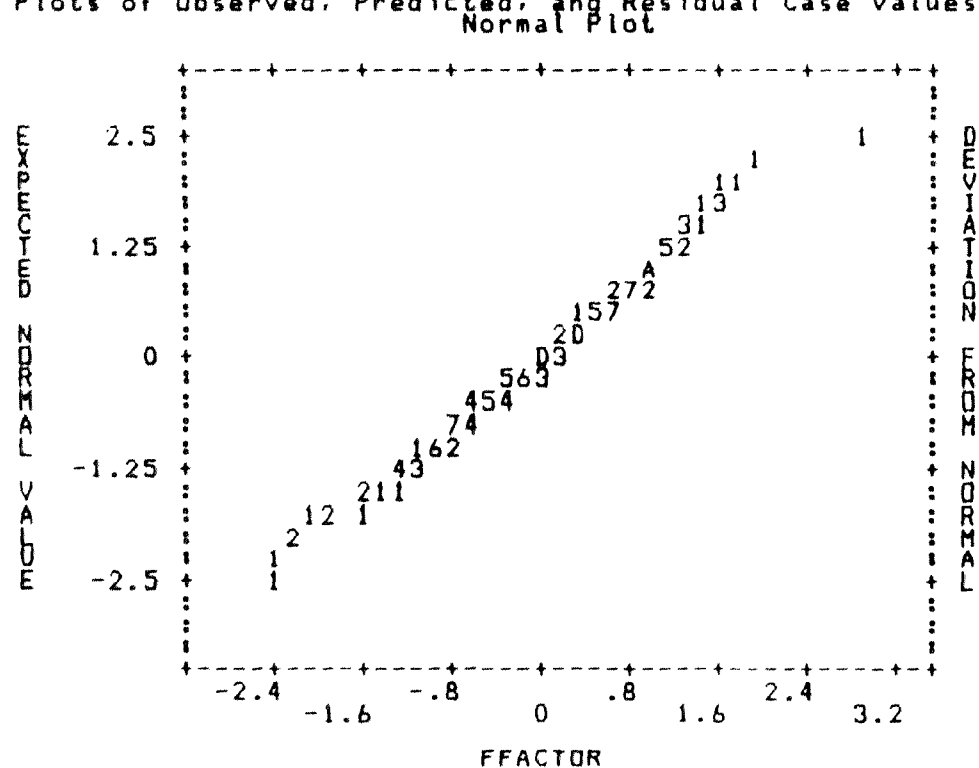


Detrended Normal Plot

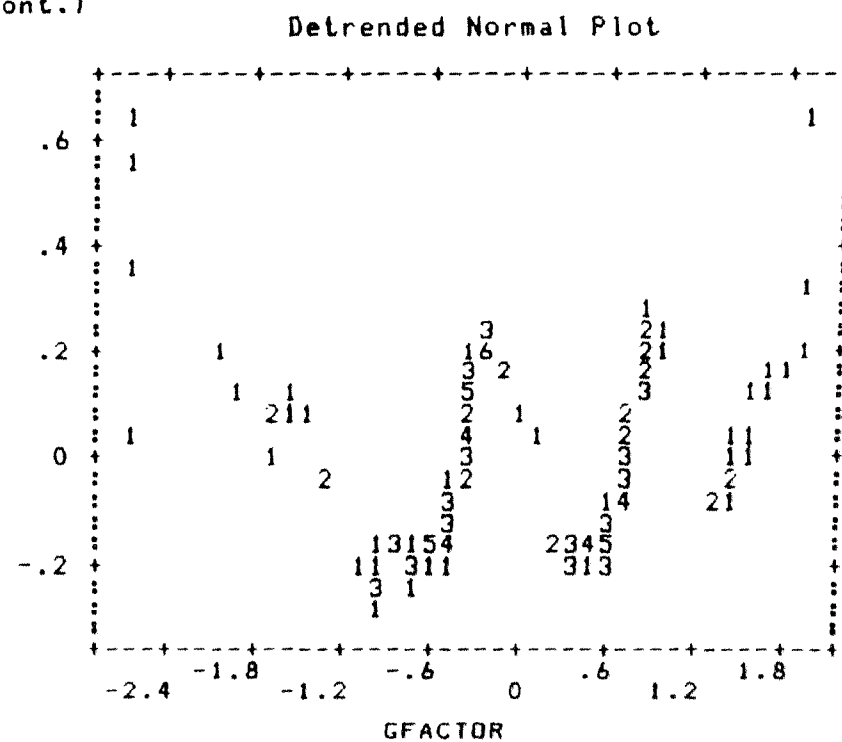
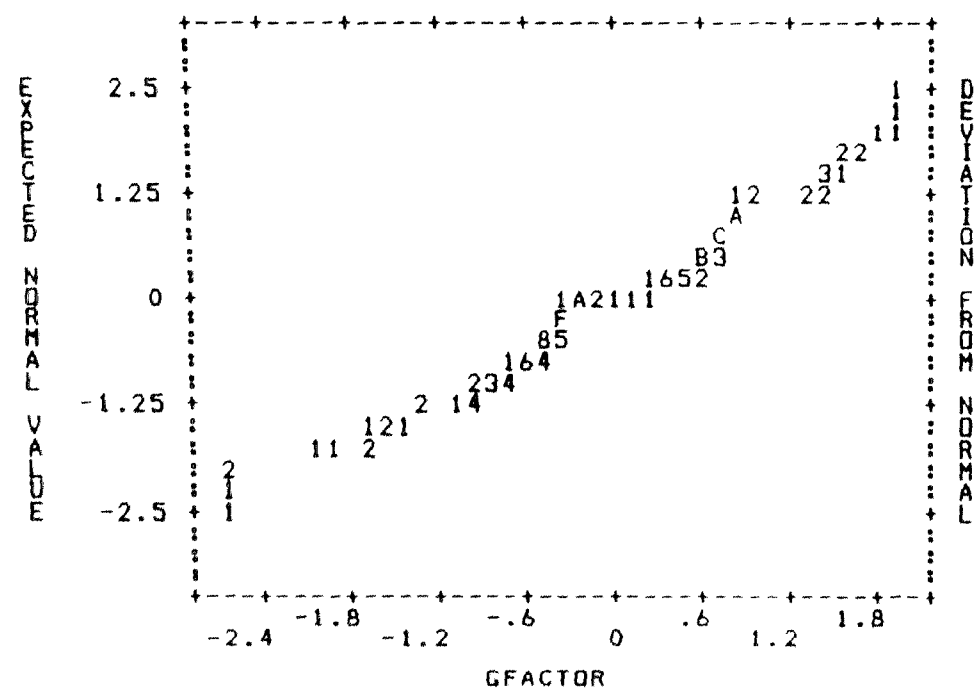


Plots of Observed, Predicted, and Residual Case Values (Cont.)

Plots of Observed, Predicted, and Residual Case Values (Cont.)



\*\*\*\*\* ANALYSIS OF VARIANCE -- DESIGN 1\*\*\*\*\*  
 Plots of Observed, Predicted, and Residual Case Values (Cont.)



Plots of Observed, Predicted, and Residual Case Values (Cont.)  
Normal Plot

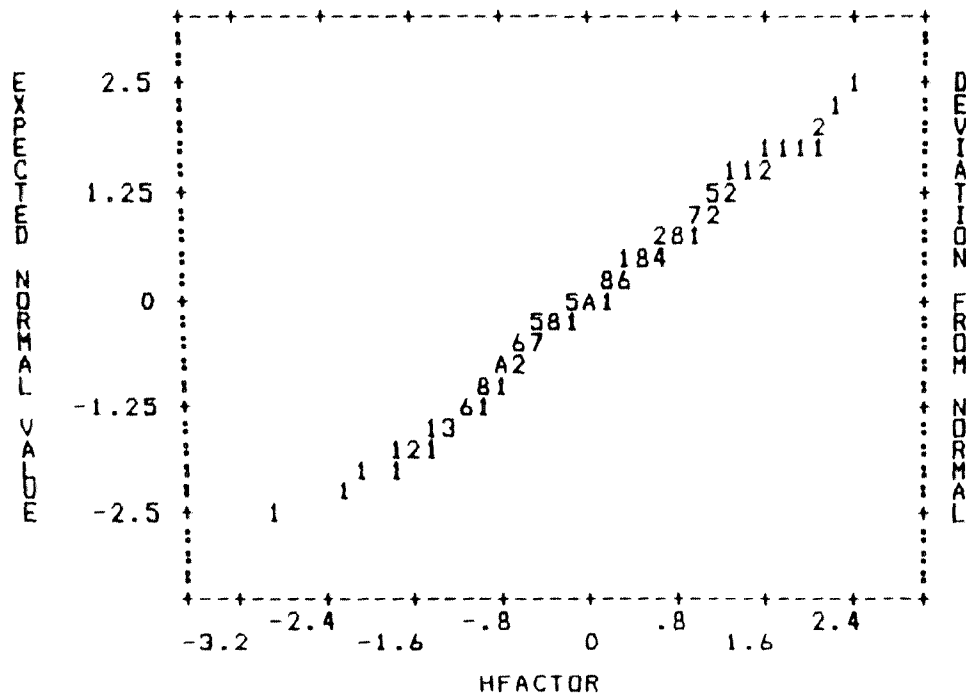


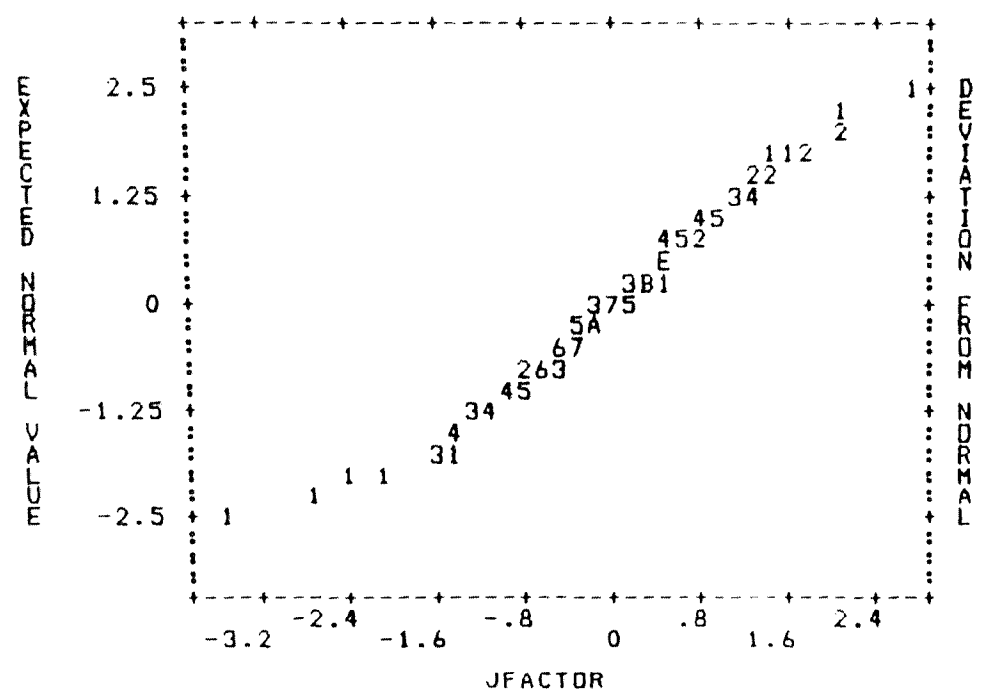
Figure 1 is a scatter plot showing the distribution of HFACTOR values for 1000 random points. The x-axis is labeled 'HFACTOR' and ranges from -3.2 to 2.4. The y-axis ranges from -0.25 to 0.25. The data points are labeled with numbers 1 through 5, indicating different categories or clusters. The distribution is roughly bell-shaped, centered around HFACTOR = 0.



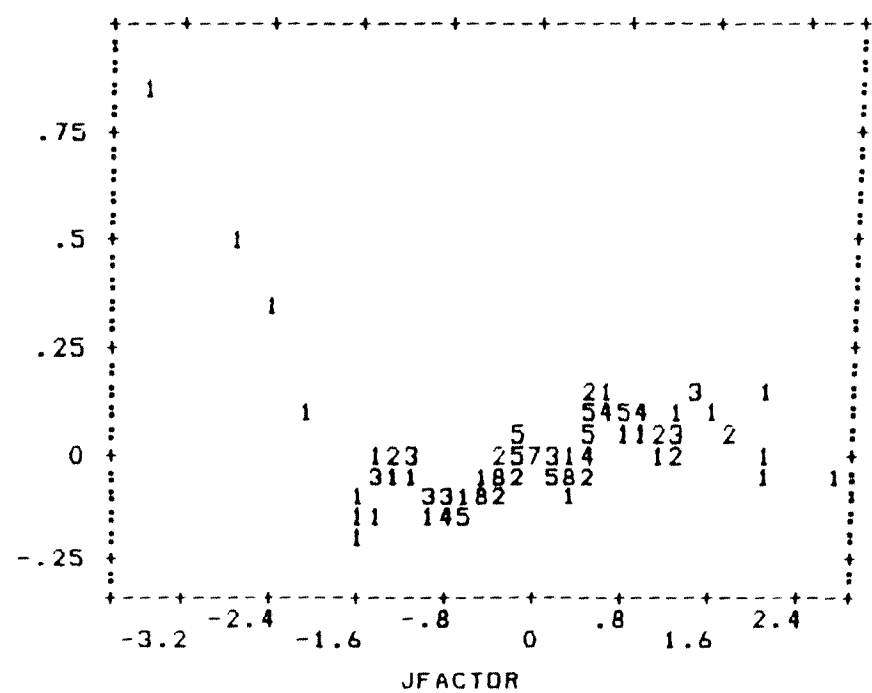
\*\*\*\*\* ANALYSIS OF VARIANCE -- DESIGN 1\*\*\*\*\*

Plots of Observed, Predicted, and Residual Case Values (Cont.)

Normal Plot



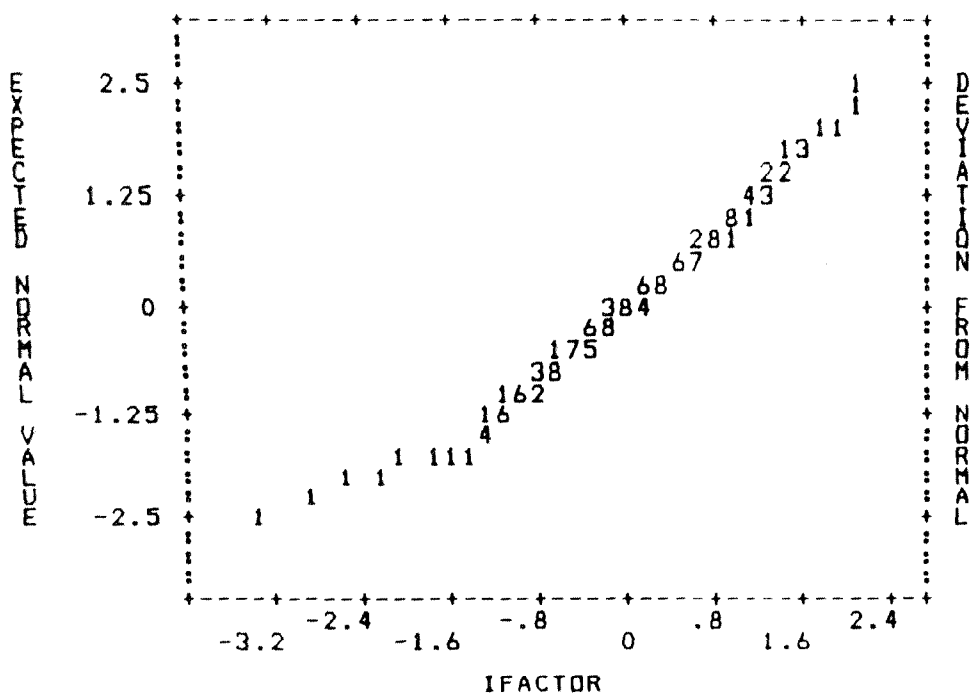
Detrended Normal Plot



## Plots of Observed, Predicted, and Residual Case Values (Cont.)

Plots of Observed, Predicted, and Residual Case Values (Cont.)

### Normal Plot



Detrended Normal Plot

